alwitra

DIE DACHMARKE

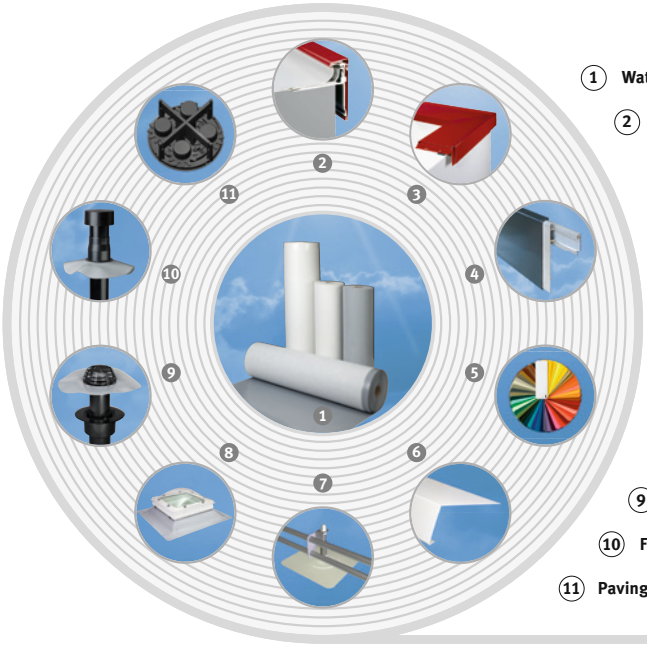
EVALASTIC®
Waterproofing Membranes
Installation Manual

EVALASTIC®

The homogeneously seam welded EPDM membrane.

alwitra product system

EVALASTIC® waterproofing membranes are part of the proven alwitra waterproofing system. This system comprises:



1. Waterproofing membranes
2. Roof edge trim profiles incl. colour coating
3. Wall capping profiles incl. colour coating
4. Wall flashing profiles incl. colour coating
5. Colour coating
6. Coated metal sheets
7. Snow guard profile
8. Daylight systems
9. Rainwater outlets
10. Flat roof vents
11. Paving slab supports

Please see our tutorial videos for laying and welding the waterproofing membranes EVALASTIC® under http://alwitra.de/en/videos-english/ or scan the QR-Code.

alwitra flat roof systems

With its flat roof systems EVALON® and EVALASTIC® alwitra offers two technically and technologically aligned product groups for intelligent roof waterproofing solutions with a worldwide record of experience, including all flashings, cappings and roof penetrations, permanently and reliably resisting any impacts and stresses.

To complement the core system elements, i. e. the waterproofing membranes, the complementary system components

- roof edge trim profiles incl. colour coating
- wall capping profiles incl. colour coating
- wall flashing profiles incl. colour coating
- daylight systems
- rainwater outlets
- flat roof vents
- paving slab supports
- snow guard profiles

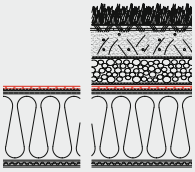
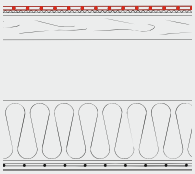
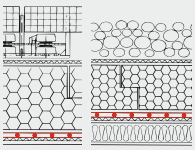
are matched in form, colour, function, jointing techniques and characteristics.

All flat roof system products can be installed safely and quickly, they provide maximum creative freedom and are particularly economic due to their durability.

alwitra installation tool set

consisting of:

- silicone roller
- brass roller
- seam checker
- membrane scissors
- membrane cutter
- brush bottle for solvent welding agent
- flat brush
- squeeze bottle for EVALON® liquid
- folding ruler
- ballpen
- installation manual
- protective gloves
- service bag

Fields of application Flat roofs	Installation method		
	WATERPROOFING MEMBRANES loose laid with ballast gravel, roof gardens, concrete paving slabs	**WATERPROOFING MEMBRANES mechanically fastened** in seam overlap	**WATERPROOFING MEMBRANES bonded** with cold or hot-melt adhesives
non-ventilated roofs (warm deck roofs) 	**EVALASTIC®V** depending on the purpose and the conditions, especially unevenness of the substrate	**EVALASTIC®V** depending on the building material class of the insulation material and on the approved roof build-up	**EVALASTIC®V** **EVALASTIC®VGSK** on thermal insulation materials with backing or fire-retardant layer, depending on the approved roof build-up directly on bitumnous waterproofings to be refurbished or self-adhesive EVALASTIC® VGSK, bonded directly on unbacked rigid EPS foam boards.
ventilated (two layer) roofs (cold deck roofs) 	**EVALASTIC®V** depending on the conditions, especially unevenness of the substrate	**EVALASTIC®V** depending on the building material class of the upper layer and on the approved roof build-up	**EVALASTIC®V** **EVALASTIC®VGSK** on a non-combustible upper layer or fire retardant layer, depending on the approved roof build-up
inverted roofs DUO roofs 	**EVALASTIC®V** depending on the conditions, especially unevenness of the substrate		

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1 Subject and range of application

This installation manual contains basic rules and serves as a guideline for roof waterproofing with **EVALASTIC® waterproofing membranes** for new building and refurbishment. They are the manufacturer's instructions and guidelines for roofers and construction site managers. They are the result of decades of practical experience in the laying of alwitra waterproofing membranes on millions of square metres of roof areas.

Adherence to the relevant technical rules, as published in standards and regulations, as well as to the workers protection and safety regulations is obligatory.

The handling instructions and notes on container labels and safety data sheets for alwitra adhesives and auxiliary materials are to be observed.

Drawings included in these instructions are not true to scale and are schematic.

As of March 2015 [1]
Technical changes reserved

[1] This manual replaces all former alwitra installation manuals for EVALASTIC® waterproofing membranes.

2 Product range

EVALASTIC® waterproofing membranes are high-quality synthetic membranes which come in 2 different types, complete with preformed details, coated metal sheets and auxiliary materials.

	EVALASTIC® V with polyester fleece backing	**EVALASTIC® VGSK** with glass / polyester fleece backing and self-adhesive coating
effective thickness of waterproofing layer [mm]	1.2 / 1.5	1.5
Membrane widths [m] - with welding lap on one side - with welding lap on both sides	 1.05 / 1.55 1.09 / 1.59	 1.05
Tape widths [cm]	54 / 79	
Standard length [m]	25	
Specified lenghts	on request	
Standard colours	light grey	
Special colours	on request	

Accessories:

EVALASTIC® tape widths [cm], unbacked	16 / 20 / 25 / 33 / 50 / 66 / 75 / 105 / 155	
EVALASTIC® preformed details - internal / external corners - flange [1] - lightning conductor and cable penetrations	 • • •	
EVALASTIC® coated metal sheets - sheets 1 m x 2 m	 light grey	
Adhesives - alwitra L 40 - alwitra PUR D	 • [5] • [5]	
alwitra membrane cleaner	•	
EVALASTIC® VSKA tapes self-adhesive [cm] - with welding lap on one side - with welding lap on both sides	 33 / 43 66 / 86	
alwitra primer SK **alwitra primer SK-L**	• [2] • [2]	• [2, 3] • [2, 3]

[1] For alwitra flat roof rainwater outlets and vents

[2] Primer for EVALASTIC® VSKA tapes

[3] Primer for various substrates, e. g. bituminous membranes

3 Packing, transportation, storage and disposal

3.1 Packaging, transportation and storage of the waterproofing membranes and the auxiliary materials

At the factory, the waterproofing membrane rolls are individually wrapped and laid horizontally on pallets of up to 15 units, for transportation.

After long-term storage, small buckles may show at the roof membrane after laying. [2]

The membrane rolls must be stored horizontally on a dry and clear area. They must be stored in a sheltered area, or covered with tarpaulin. Moisture on the membranes may impair weldability.

Fully loaded pallets have a weight of 470 kg to 1,500 kg. Temporary storage on roofs should be in rolls and evenly spread over the roof deck, on lightweight steel decking only in load bearing areas.

The auxiliary materials are packed in weather-proof synthetic/tin containers, hobbocks or cans. **Please note the storage conditions and shelf life warnings on the container labels!** Materials from open containers can be handled only for a short time.

[2] See also 4.1 Tips for installation.

3 Packing, transportation, storage and disposal

3.2 Disposal of construction site waste and packaging material

The EVALASTIC® waterproofing membranes have also been designed to avoid waste. When installing them, there does not have to be unnecessary extra material. Construction site waste [3] does **not** need special monitoring.

[3] Construction site waste (waste materials classification 17 09 04) are matters in the form of mixed residuary building materials. This includes waterproofing membranes, membrane tapes and old waterproofing membranes (the corresponding national regulations apply).

4 Waterproofing concept for the roof area

4.1 Application principles

Roof waterproofing design [4] ›› non-used roof areas

According to DIN 18531 - waterproofing for **non-used** roofs - the minimum nominal thicknesses of synthetic waterproofing membranes are to be designed according to requirements and application category.

Application category K1 (standard configuration)

Roof waterproofing to meet standard requirements fall into application category K1. As a precondition, the minimum slope of the surface to be waterproofed must not be less than 2 %.

The following applies for EPDM membranes (EVALASTIC®):
Minimum nominal thickness **1.2 mm** (Thickness without backing and self-adhesive layer)

e. g. EVALASTIC® V with polyester fleece backing
Marking according to DIN 18531-2
DE/E1 EVA-BV-K-PV-1.2

DE= roof waterproofing single ply
E1= property class 1
EPDM= description of synthetic material
BV= bitumen-compatible
K= backing
PV= polyester fleece
1.2= membrane thickness in mm without backing

For roofs and/or roof areas with a slope ‹ 2 %, as regards material selection for the roof waterproofing the design rules for application category **K2** apply.

[4] The corresponding national regulations apply.

4 Waterproofing concept for the roof area

Application category K2 (enhanced configuration)

Roof waterproofing to meet higher demands of designers/investors (e. g. due to high-grade building usage, multi-storey buildings, difficult-to-access buildings) fall into category K2. A slope of at least 2 % at waterproofing level and at least 1 % in the valley areas must be observed.

The following applies for EPDM membranes (EVALASTIC®):
Minimum nominal thickness **1.5 mm**
(Thickness without backing and self-adhesive layer)

›› Used roof areas

For **used** roofs (DIN 18195) with **high** loads, e.g. terraces, intensive roof gardens,
the minimum nominal thickness is **1.5 mm** (Thickness without backing and self-adhesive layer)

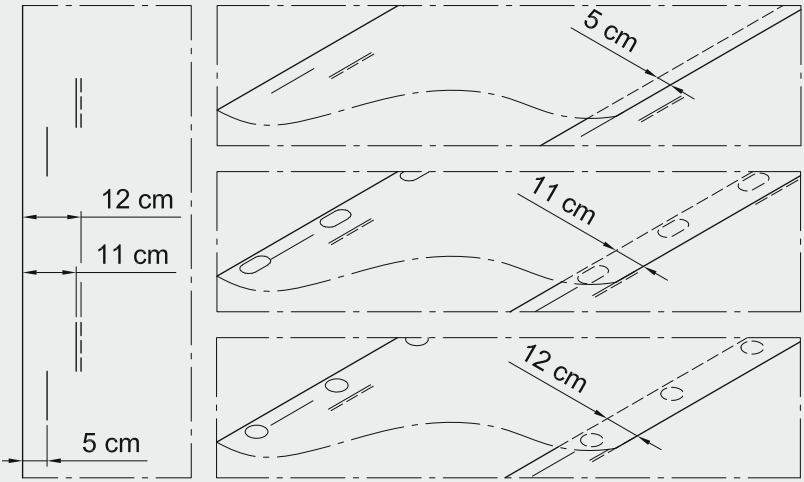
e. g. EVALASTIC® V with polyester fleece backing
Marking according to DIN 18195-2
BA EVA-BV-K-PV-1.5

BA= waterproofing for foundations
EPDM= description of synthetic material
BV= bitumen-compatible
K= backing
PV= polyester fleece
1.5= membrane thickness in mm without backing

4 Waterproofing concept for the roof area

›› Seam overlap

EVALASTIC® waterproofing membranes are marked with several dashed lines along one longitudinal edge. These **markings** can be used as **guiding lines** for the corresponding lap width and are



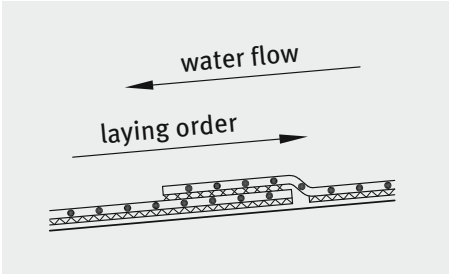
- **approx. 5 cm** for bonding and loose laying under ballast (min. overlap 4 cm)
- **approx. 11 cm** for load distribution plates 40 x 82 mm
- **approx. 12 cm** for load distribution plates Ø 50 mm

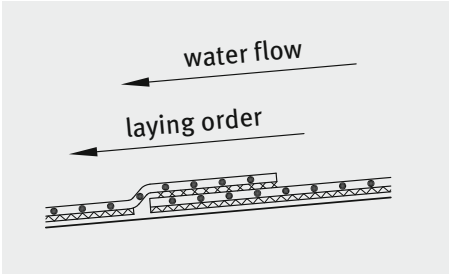
For application on unbacked, rigid polystyrene foam (e. g. EVALASTIC® V, loose laid under ballast), the lap width should be at least 6 cm. If necessary, the insulation boards have to be protected from hot air ingress or spilt solvent agent in the membrane lap area to avoid damage to the insulation material.

4 Waterproofing concept for the roof area

›› Laying order

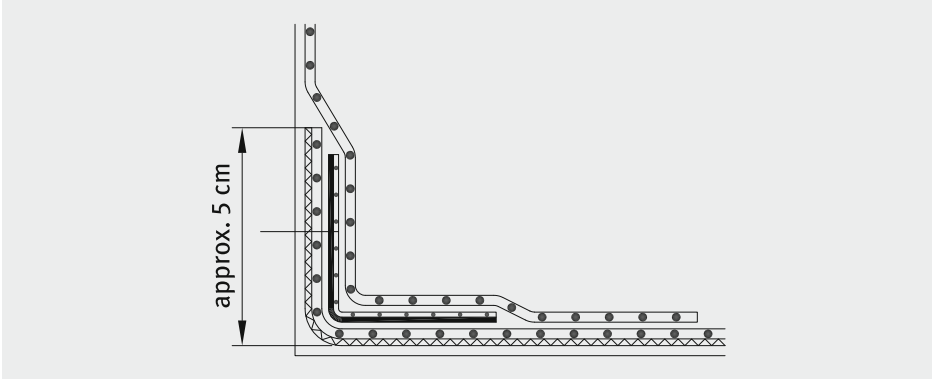
Regardless of the type and the laying method of the membranes, the seam laps can be arranged **both with or against the "water flow"**, due to the homogeneous seam welding. When installing with the "water flow", water may ingress under already laid membranes if it rains while waterproofing works are still in progress.





›› "Separation" of the roof waterproofing

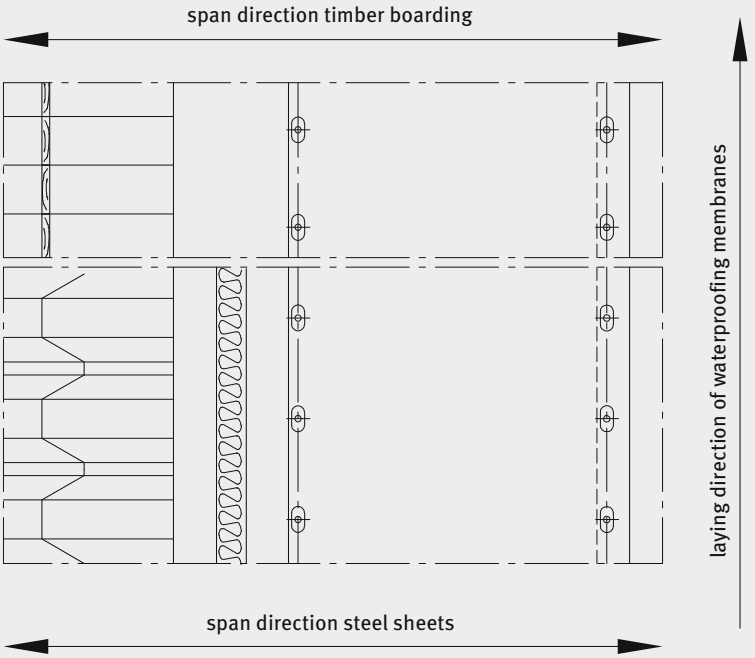
The field sheet is always "separated" from the waterproofing membrane of parapet and kerb flashings. However, membranes of the field area are principally raised approx. 5 cm on parapets and kerbs. Timber or insulation fillets are not required.



4 Waterproofing concept for the roof area

›› Laying direction

Generally, the EVALASTIC® waterproofing membranes can be laid parallel or perpendicular to the roof slope. If using mechanical seam fastening of the waterproofing membranes on corrugated steel or timber decks, the membranes have to be laid **perpendicularly to the span direction** of the steel sheets or the boarding.



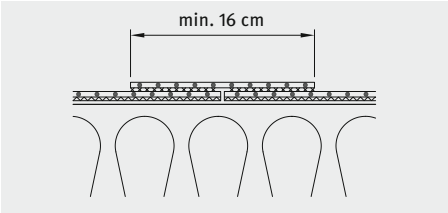
›› Position of butt joints

At the end of the membrane, i. e. normally after 25 m, the backed EVALASTIC® V / VGSK waterproofing membranes can be butt-jointed or hot air welded at an overlap of approx. 2 - 3 cm and covered with an unbacked tape of at least 16 cm width.

4 Waterproofing concept for the roof area

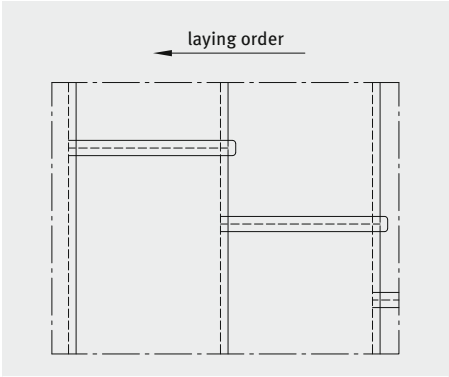
Unbacked membranes, however, are laid, correspondant to the longitudinal edge, with an overlap of at least 4 cm at the end of the membrane.

Double T-joints should be avoided!

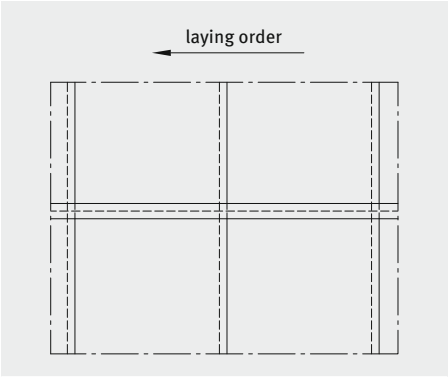


Double T-joints are avoided by a staggered arrangement of the membrane ends.

If membrane ends are arranged withoutstagger, the end joints are to be covered with an unbacked tape of at least 16 cm width.



Positioning of membrane ends with offset



Positioning of membrane ends without offset

In case of low ambient temperatures, small ripples may show on the waterproofing membrane after laying (especially when warm weather returns).

›› Tips for installation

Fix the membranes at one end mechanically, then heat the membranes slightly during installation and pull it tight.

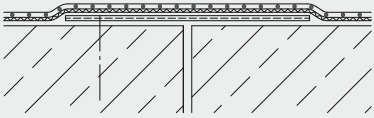
4 Waterproofing concept for the roof area

›› Formation of expansion joints

Waterproofing of **type I** joints (DIN 18531):

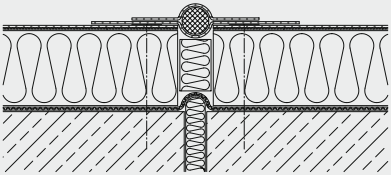
Over the joint the roof waterproofing can be laid flat in a single ply. For roof waterproofing with EVALASTIC® waterproofing membranes over joints, they

- can be laid flat in **bonded** build-ups with expansions up to **5 mm**
- in case of **loose laid** EVALASTIC® membranes, can be laid over joints up to **10 mm**, provided the membranes are supported at the joint area.



Waterproofing of **type II** joints (DIN 18531): Depending on the extent and the frequency of expansion joints, the type of sealing is to be decided upon individually, e.g.

- by installing loops of EVALASTIC® tapes including suitable support profile (e.g. round PE foam cord) for expansions up to **25 mm** (joint width up to 30 mm)



Type II joint sealing may be raised over the waterproofing level, e. g. by placing wedge-shaped insulation elements or cants (fillets). Parts of the field area separated by elevations have to have independent drainage.

4.2 Selection of membrane / tape widths

The manufacturing of different membrane and tape widths allows for a quick and almost faultless laying, regardless of the roof geometry and the laying method (see chapter 6).

- For loose laid waterproofing membranes **(EVALASTIC® V)** with ballast, membrane widths up to 1.55 m can be used.

- For loose laid and mechanically seam fastened waterproofing membranes, usually **EVALASTIC® V membranes** are used according to the fastening plan. Depending on the required amount of fasteners, 1.05 m / 1.55 m wide membranes and 0.54 m / 0.79 m wide tapes are available.

- For bonded waterproofing membranes **(EVALASTIC® V)** depending on the application method (rolling / folding), membrane widths of 1.55 m or 1.05 m or **EVALASTIC® VGSK** with a self adhesive coating and a width of 1.05 m on a suitable substrate can be used.

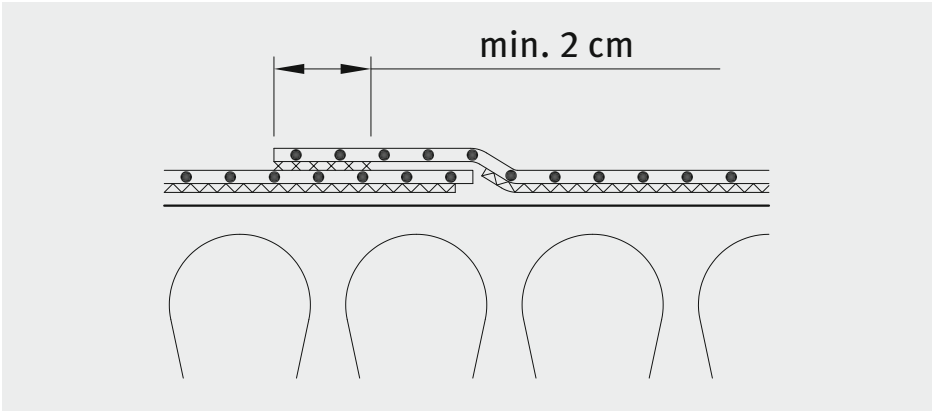
5 Welding techniques

The overlap of several EVALASTIC® waterproofing membranes or with EVALASTIC® coated metal sheets is intended to provide a homogeneous connection of materials or welding, which is free from extraneous matter. The welding is almost entirely independent of the weather conditions.

The overlapping areas must be dry and free of dirt and debris. The contact areas are heated with hot air to a workable condition,or evenly wetted with solvent welding agent and fused with moderate pressure. If seam edges are welded over with the next membrane, a tape, or a preformed detail, they have to be chamfered over the whole width of the welding seam to avoid so called capillary effects (e. g. T-joints).

5.1 Hot air welding

The seams have to be seal-welded **at least 2 cm** from the top edge of the membrane.



5.1.1 Conditions

Hot air welding is possible without further measures at ambient temperatures of at least +5 °C. Depending on the weather conditions and the model of hot air welding machines the hot air temperature should be approx. 430 - 540 °C. By preheating the seam areas, welding is also possible at lower ambient temperatures.

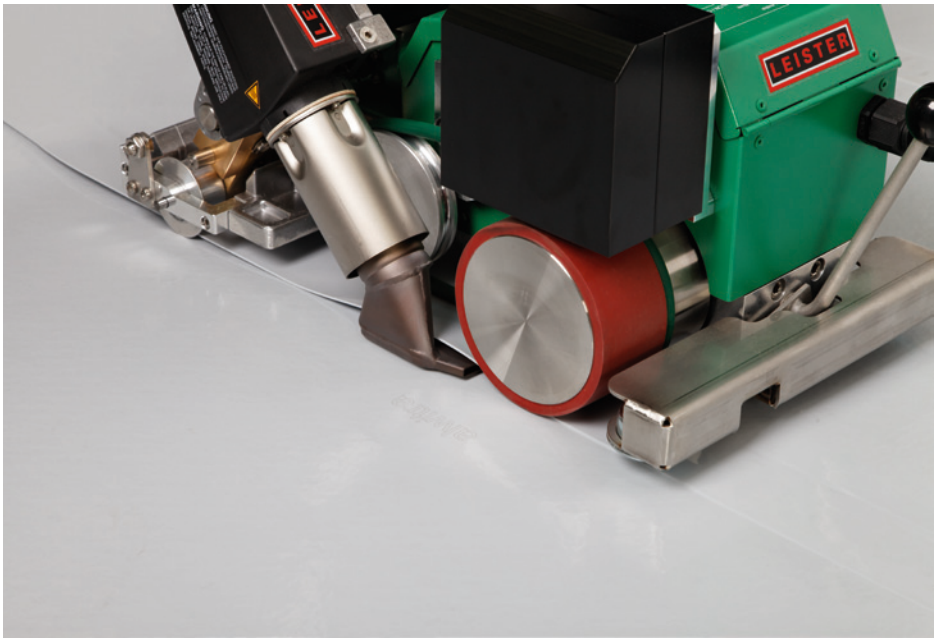
Test welds are obligatory!

5 Welding techniques

5.1.2 Hot air welding with welding machines

For the hot air welding of EVALASTIC® waterproofing membranes, all approved self-propelled hot air welding machines for synthetic membranes can be used[5].

With hot air welding machines **1.7 m to 3.5 m of seam per minute** can be welded. The seams are welded in one operation.



[5] For further information please contact alwitra.

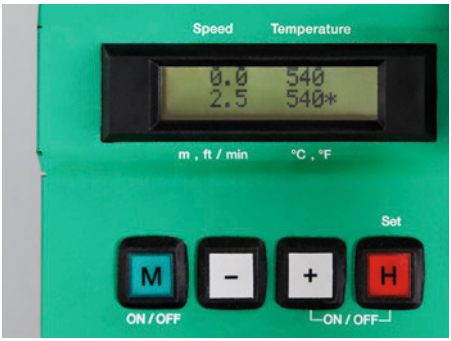
5 Welding techniques

Depending on

- the ambient temperature and possible wind
- the temperature of the substrate and
- the temperature of the waterproofing membranes

at the machine [6]

- the speed
- if necessary, the volume of air and
- the hot air temperature have to be adjusted

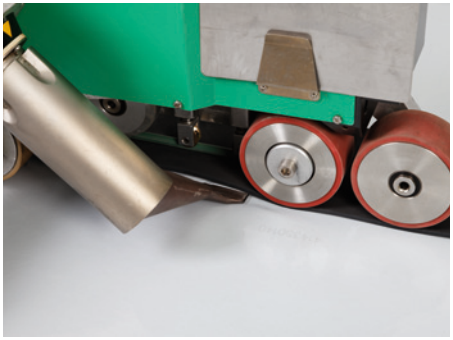


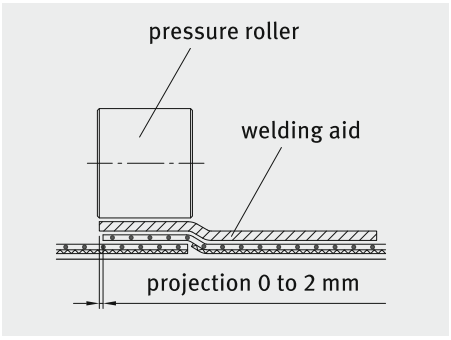
to ensure an even and homogeneous fusing in the weld.

Test welds are obligatory!

For welding machines without crawler drive, and depending on the weather conditions and the roof slope, a welding aid may be necessary to ensure a weld seam without wrinkles.

The alwitra welding aid, made of non-welding elastomeric material (150 mm wide and approx. 25 m long) is loosely placed onto the membrane immediately infront of the welding machine, level with the upper edge and is removed after welding for further use.





[6] Please note the manufacturer's operating instructions, especially the connected loads! 230 V, 4,600 W, 20 A / 380 V, 5,000 W, 15 A.

5.1.3 Manual hot air welding

All hot air guns[7] with an angled nozzle (approx. 40 mm wide), which produce the necessary hot air temperature of approx. 430 - 540 °C, can be used.

The hot air gun is to be inserted at an angle of

- approx. 45° to the membrane edge and
- approx. 30° to the roof area

into the seam overlap.

Membranes are seal-welded in one operation by moving backwards, where as small tapes (up to 33 cm) are first tacked and then seal-welded.

When seal-welding, **the nozzle must be inserted between the membranes in a way that the top membrane edge will also be heated and plastified.**

The plastified lap areas will be fused by applying moderate pressure with a silicone pressure roller, following parallel to the opening of the nozzle. Due to the backwards movement, the nozzle always blows against already seal welded areas of the seam.

[7] Please note the manufacturer‘s operating instructions, especially the connected loads! e. g. Leister, Type Triac.

5 Welding techniques

5.2 Welding of T-joints

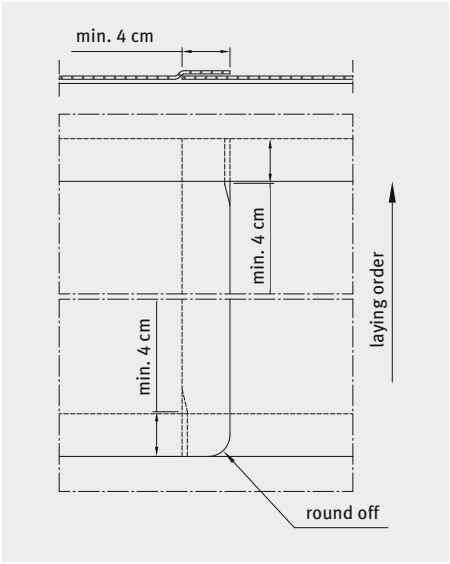
T-joints must be formed very carefully, in order to prevent capillary action.

T-joints must be thoroughly welded with hot air (hot air gun) only.

5.2.1 Butt joints of unbacked membranes

Unbacked membranes are laid, correspondant to the longitudinal edge, with an overlap of at least 4 cm at the end of the membrane. **The top corner of the membrane must be rounded off!**

Before welding the T-joint, the respective inner (middle) membrane end must be chamfered over the whole lap width (min. 4 cm).

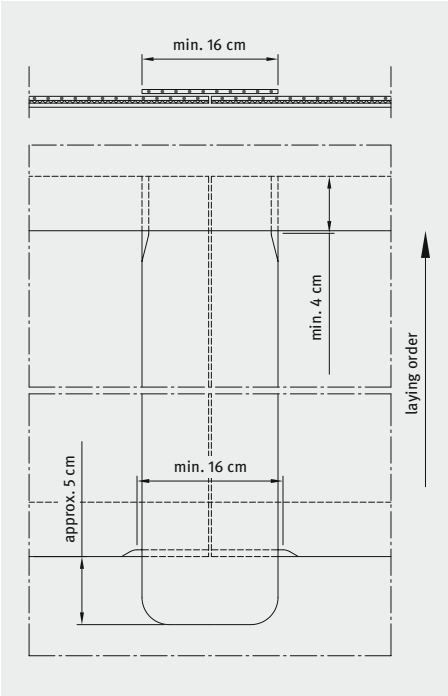


This can be done with the hot nozzle of a hot air gun, if necessary, with a metal plate serving as an underlay.

5.2.2 Butt joints of backed membranes

Backed membranes (EVALASTIC® V / VGSK), at the end of the membrane, are tacked or bonded with hot air with an overlap of approx. 2 - 3 cm [8] and covered with an unbacked tape [9] of at least 16 cm width. The length of the tape: membrane width + approx. 5 cm. **At one end of the tape, both corners have to be rounded off.**

Place the tape at the centre of the joint with the rounded-off end extending approx. 5 cm onto the previously laid membrane, which is through at the joint. The other side of the tape should end level with the membranes to be joined. Tack the strip in this position, in the middle, with hot air and seal it all around the perimeter.



The longitudinal seam edges of the membranes to be joined, which are under the rounded-off end of the tape, must be chamfered at a width of approx. 5 cm or 10 cm each. As must the longitudinal seam edges at the other end of the tape itself, at the width of the lap.

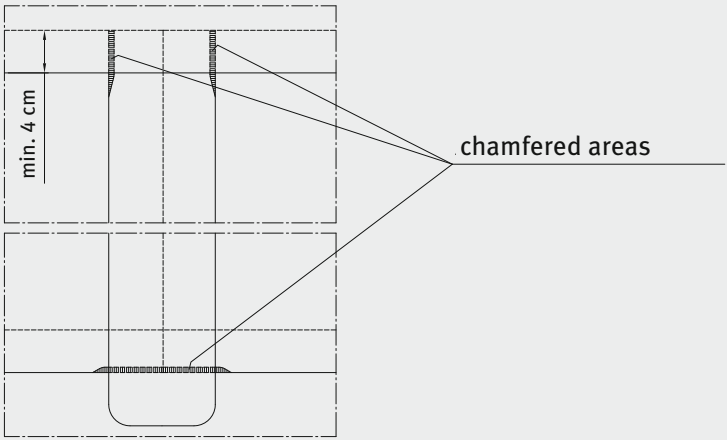
After chamfering, the strip will be seal-welded at its longitudinal edges and at the rounded-off end. **Be especially careful when welding the chamfered areas with hot air.**

[8] Advantageous at low temperatures.

[9] 16 cm tape width for mechanically fastened waterproofing membranes, e. g. if fasteners are placed at the butt joint.

5 Welding techniques

The welding edge of the following membrane overlaps another longitudinal edge of the joined membranes and the tape in the chamfered area by at least 4 cm. **Again, be especially careful when welding the chamfered areas with hot air.**



5.3 Seam checking

After the seam has cooled down to the ambient temperature, the sealing layer from the seam edge (min. 2 cm) must be cohesive without any foreign matter over the complete welding width, and the seam has to be permanently waterproof and highly resistant. The performance of the roof sealing depends to a great extent on the quality of the seam.

In order to detect possible voids, the welding seams must be tested over the complete length, paying special attention to the T-joints.

5 Welding techniques

A non-destructive test along the seam edges can be done by the roofer with an alwitra seam checker.[10]

At voids the point of the seam checker can penetrate into the overlap. **Seal-weld voids with hot air (hot air gun).** Welded seams on coated metal angles can be tested only by means of a peeling test; therefore the sealing has to be cut.

[10] Other test methods, such as vacuum testing, are normally not available to the roofer.

5.4 Leak test

5.4.1 Leak test by flooding

Leak testing of the roof waterproofing by flooding is possible. After completion of the roof waterproofing incl. seam testing and, if necessary, sealing, the roof area is flooded with coloured water (e.g. fluorescein sodium) for several days to an average height of at least 10 cm (=1 kN/m²). All outlets are to be temporarily closed. The water level on the roof must be checked every day and there also have to be visual controls carried out inside the building (e. g. also with UV lamps) and the results recorded.

After completion of the flooding test, the roof must be drained **(be careful when opening the outlets!)**, inspection samples of the complete build-up structure are taken at the lowest points.

In case of leakages, considerable moisture may intrude into the roof build-up.

A leak test by flooding is only possible if the additional load will not exceed the bearing capacity and the safe deflexion of the supporting substructure.

5.4.2 Leak test by measuring

Specialized organisations like building diagnostics companies provide leak testing of roof waterproofing using appropriate measuring methods. The results of the leak test should be included into the Acceptance Report.

5 Welding techniques

5.5 Welding of weathered membranes

Generally, weathered EVALASTIC® waterproofing membranes may be fused with new material (EVALASTIC®) on site after years. Necessary technological changes (closing of roof penetrations, flashing of new penetrations to the existing roof waterproofing) and repairs of damage resulting from inexpert handling, can be carried out with the same material.

- Where it is to overlap with the new material, the weathered surface must be thoroughly cleaned with low-surface-tension water (water with dish-washing liquid) and dried.
- Precleaned areas must be wiped with a clean cloth soaked with alwitra membrane cleaner to remove dissolved particulate matter.
- The overlapping areas must be absolutely dry and free of dirt and debris.
- Weld the EVALASTIC® respectively EVALASTIC® R tape with hot air.

Test welds are obligatory!

Welding is carried out with hot air (hot air gun)!

Weathered unbacked membranes - if the underneath is clean - can also be welded to underlying new material. Humidity and moisture trapped under the membranes may impair weldability. The described pretreatment, particularly the drying, is essential for the welding area.

6 Laying methods and fixing of the roof waterproofing

The waterproofing membranes can be fixed against wind uplift by

- ballast,
- mechanical fastening or
- bonding.

Ballast and mechanical fastening also fix build-up layers under the waterproofing membrane, which can thus be loose laid. **Bonding of the waterproofing membrane is only possible if the build-up layers are stationary, and on substrates, which are suitable for the corresponding adhesive.**

6.1 Wind loads at the flat roof

The required

- mass (weight) of the ballast,
- amount of mechanical fasteners or
- amount of adhesive

for the expected wind loads must be calculated with regard to

- the location (wind zone, height, building category),
- the dimensions of the building,
- the form / slope of the roof and
- the substrate / wall openings

and should be differentiated according to

- the centre area
- the perimeter area
- the corner area

of the roof.

The calculation has to be done as a project-related individual calculation, according to DIN EN 1991-1-4 or to the corresponding national regulations.

6 Laying methods and fixing of the roof waterproofing

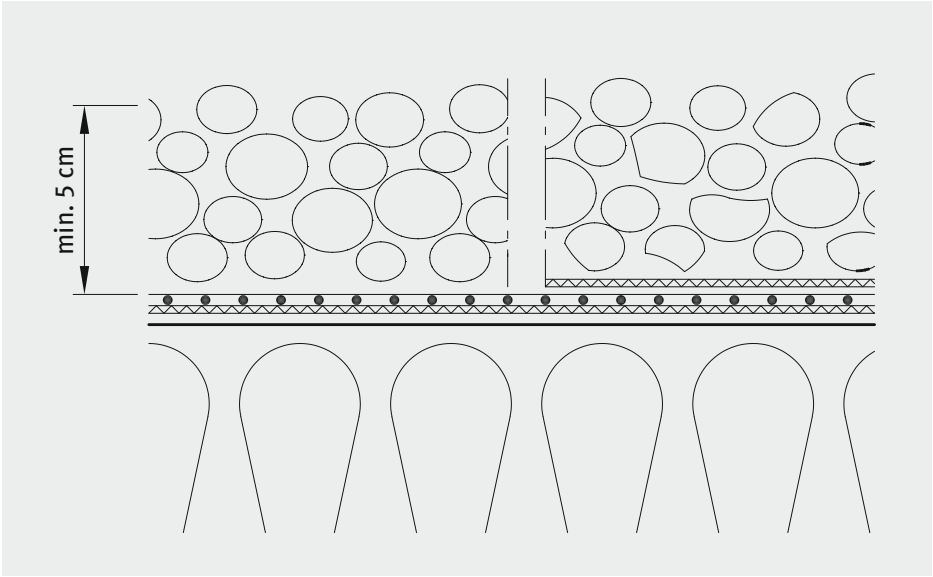
6.2 Waterproofing membrane loose laid with ballast

6.2.1 Types of ballast and ballast calculation

›› Gravel

consisting of washed round pebbles (16/32 mm) with max. 15 % broken stones can be directly applied as ballast on EVALASTIC® V waterproofing membranes **without a protection layer.** For higher percentages of broken stones, a protection layer must be installed (e. g. for pneumatic gravel feeding).

The thickness of the gravel layer must be at least 5 cm.



The weight of gravel 16/32 is approx. 18 kg/m² (≈0.18 kN/m²) per 1 cm fill height.

In perimeter and corner areas as well as on sloped surfaces the gravel layer can be consolidated with a suitable adhesive to prevent whirling up.

6 Laying methods and fixing of the roof waterproofing

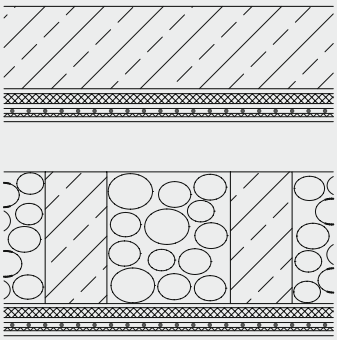
›› Concrete slabs / hollow grid tiles

A loose laid **protection layer** e. g. rot-proof fleece, building-protection mat [11] (The compatibility of materials needs to be considered.) or similar, must be placed between the roof sealing and the concrete slabs or hollow grid tiles!

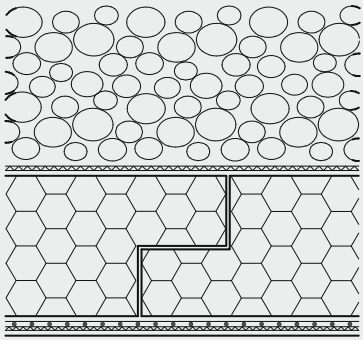
Concrete slabs laid closely together, (e. g. 100 x 25 x 5 cm) have a weight of approx. 22 - 24 kg/m² (≈0.22 - 0.24 kN/m²) per 1 cm thickness and hollow grid tiles (60 x 40 x 8 / 10 cm), filled with gravel (16/32 mm), a weight of approx. 20 kg/m² (≈0.2 kN/m²) per 1 cm thickness. The longer edge of rectangular slabs must be laid parallel to the roof edge.

›› Inverted roof

The thermal insulation, made of extruded polystyrene boards with a rebated edge, is laid in a single layer directly onto the EVALASTIC® waterproofing membranes without a separation layer. Between the thermal insulation boards and the ballast, a filter layer made of synthetic fleece (min. 140 g/m²), or a draining fleece layer, must be placed. The required thickness of the ballast [12] with loose laid waterproofing membranes is calculated for wind loads according to the “Guidelines for flat roofs”, Appendix I, or in an individual calculation. If gravel is used as ballast, the gravel layer must have a thickness of at least 5 cm.



Concrete slabs / hollow grid tiles



Inverted roof

6 Laying methods and fixing of the roof waterproofing

›› Paving flags

Paving flags can be installed on alwitra paving slab supports, in an underlayer of gravel or chalk free grit, or in a bed of mortar (on a draining layer). Between the paving slab supports or the gravel or grit underlayer and the EVALASTIC® waterproofing membranes, a protection layer of building-protection mat[11] or similar should be installed. Screed or mortar layers are to be separated from the roof sealing with a double-ply PE membrane as “sliding layer”.

alwitra paving slab support with spacer PA 20 plus:

›› Installation notes

Laying accessible paviours onto alwitra paving slab supports secured against reverse rotation and over-tightening is simple and largely unaffected by weather conditions. Once the waterproofing is completed, the following is applied one after the other:

- protection layer
- paving slab supports (if necessary, with support plates)
- paving slab (min. 4 cm thick)
- spacers

[11] E. g. “KRAITEC protect” company Kraiburg, Salzwedel, Germany or “Regupol 9510”, BSW, Bad Berleburg, Germany. Disposal of other building-protection mats can possibly lead to slight staining and embossing at the surface of the waterproofing membranes.

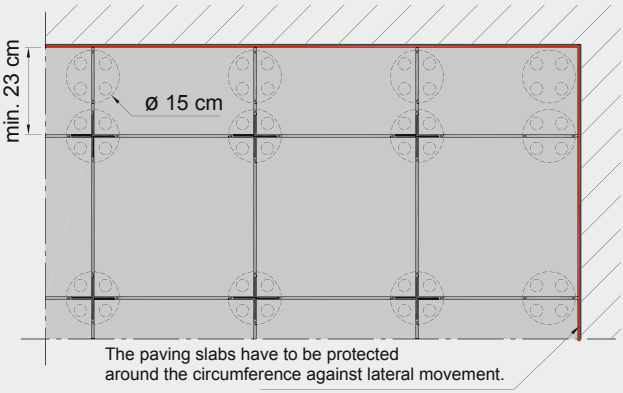
[12] Lower values indicated in admission reports for the insulation system “inverted roof” refer only to the wind uplift protection of the insulation boards.

6 Laying methods and fixing of the roof waterproofing

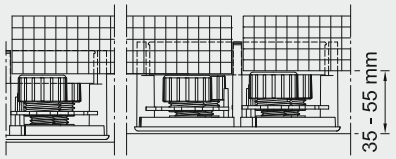
It is recommended that installation should commence from outlets towards perimeters, cutting slabs at the perimeters as required.

At the perimeters the paving must be permanently secured against lateral movement. An adjacent coarse gravel band is not sufficient.

The paving slab supports are located beneath the cross joint of four slabs. A slab is supported on each corner by one pad of the four supports. **Along the perimeter** of a paved area, paving slab supports are cut and **no spacers** installed.



Infinitely and individually height-adjustable up to 20 mm pads allow for tolerances in the thickness of paving slabs and substrate, so that the top surface is smooth and evenly sloped.



Individual height adjustment, both upwards and downwards, can be made with a screwdriver even after the paving has been laid, without the need for lifting the slab.

On the base plate, at the adjusting wheel of every pad, serrations are provided behind the spacer. Insert a screwdriver through the open joint into the serration and turn the adjusting wheel: clockwise rotation of the adjusting wheel will lower the pad, anti-clockwise rotation will lift the pad.

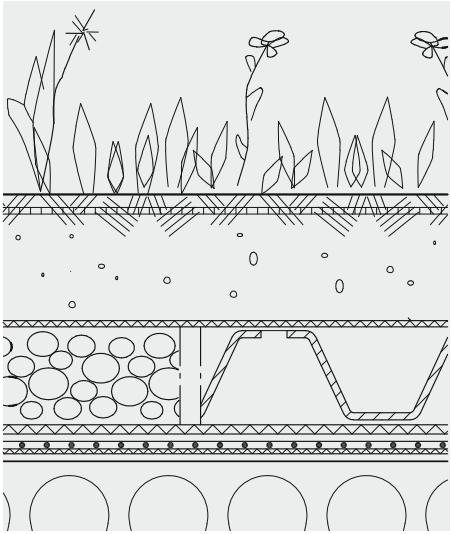
If the paving is to be installed with a lower slope than the roof waterproofing, the paving slab supports must be placed on stackable 20 mm high **alwitra support plates**.

Note: The recommended minimum-tilt of the paviours amounts 1 %.

›› Roof gardens

Between the roof garden build-up and the EVALASTIC® waterproofing membranes, a **protection layer** or a membrane combination (protection / drainage / filter layer) must be installed.

The load from the garden layers [13] depends on the material, the thickness and the moisture content of the draining, filter and vegetation mat. For calculating wind uplift, the load of the dry roof is to be taken.

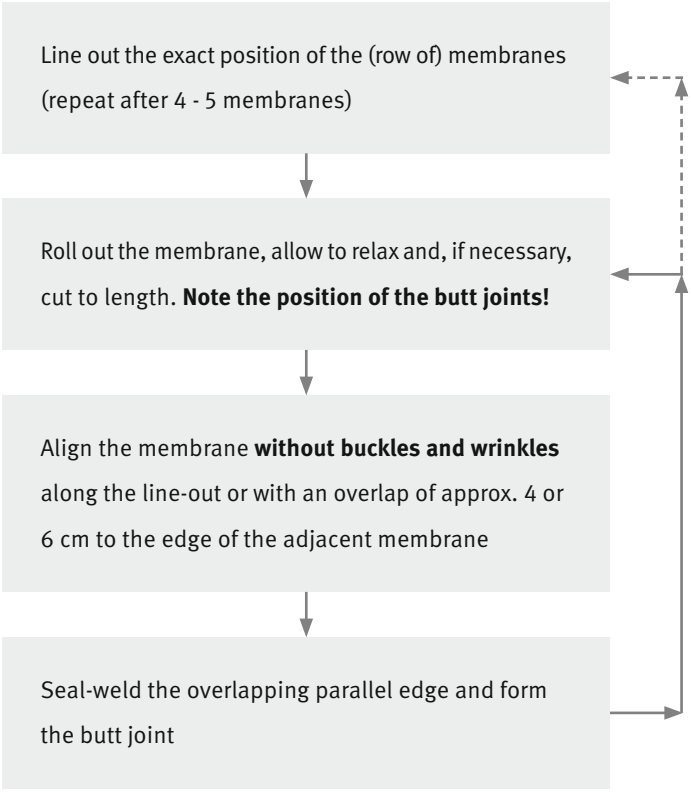


[13] Please ask your roof garden supplier.

6.2.2 Loose laying with ballast

Protection against wind uplift [14] with ballast is permissible only if the bearing capacity of the roof construction and, if necessary, the maximum deflexion for these loads have been proven.

›› Installation scheme


Line out the exact position of the (row of) membranes (repeat after 4 - 5 membranes)
Roll out the membrane, allow to relax and, if necessary, cut to length. **Note the position of the butt joints!**
Align the membrane **without buckles and wrinkles** along the line-out or with an overlap of approx. 4 or 6 cm to the edge of the adjacent membrane
Seal-weld the overlapping parallel edge and form the butt joint

The **ballast**, including protective layer, must be **applied immediately** after laying the waterproofing membranes (seam testing), if necessary in sections.

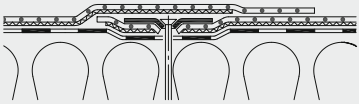
[14] Also for noise control.

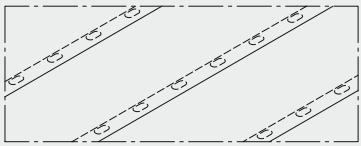
6 Laying methods and fixing of the roof waterproofing

6.3 Waterproofing membranes loose laid and mechanically fastened

6.3.1 Fastening methods and determination of the required quantity of fasteners

Loose laid **EVALASTIC® V** waterproofing membranes can be secured against wind uplift **linear in the seam overlaps** by mechanical fastening with any approved fastener:





The fastening method, as well as the required quantity of fasteners has to be indicated in the specification. The required quantity of fasteners will be determined in a project-related individual calculation. [15]

In case of refurbishment, an individual calculation should be done, if necessary based on pullout tests by the fastener manufacturer. On non-ventilated roofs, fastening of the waterproofing membrane at the same time as fastening the thermal insulation.

If the insulation boards are not sufficiently secured this way (min. 2 fasteners/m²), they must be additionally fixed prior to installing the waterproofing membrane.

[15] On request, as a service of the fastener manufacturer.

6.3.2 Fastening plan

If required, project-related individual calculations [16] will be produced, including installation instructions, material requirements and fastening plan.

The fastening plan contains

- the dimensions of the field, perimeter and corner areas, as well as
- the required quantity of fastening elements per roof area.

With mechanical seam fastening, the membrane width(s), the chord width (top chord spacing) of the metal sheets and the position of movement joints and large roof penetrations (arcade and single rooflights, natural smoke vents) are taken into consideration. In order to draw up an individual calculation and a fastening plan, a **Data Sheet** confirmed by the roofing contractor will be necessary.

[16] By the individual calculation of the respective manufacturer.

6.3.3 Fasteners

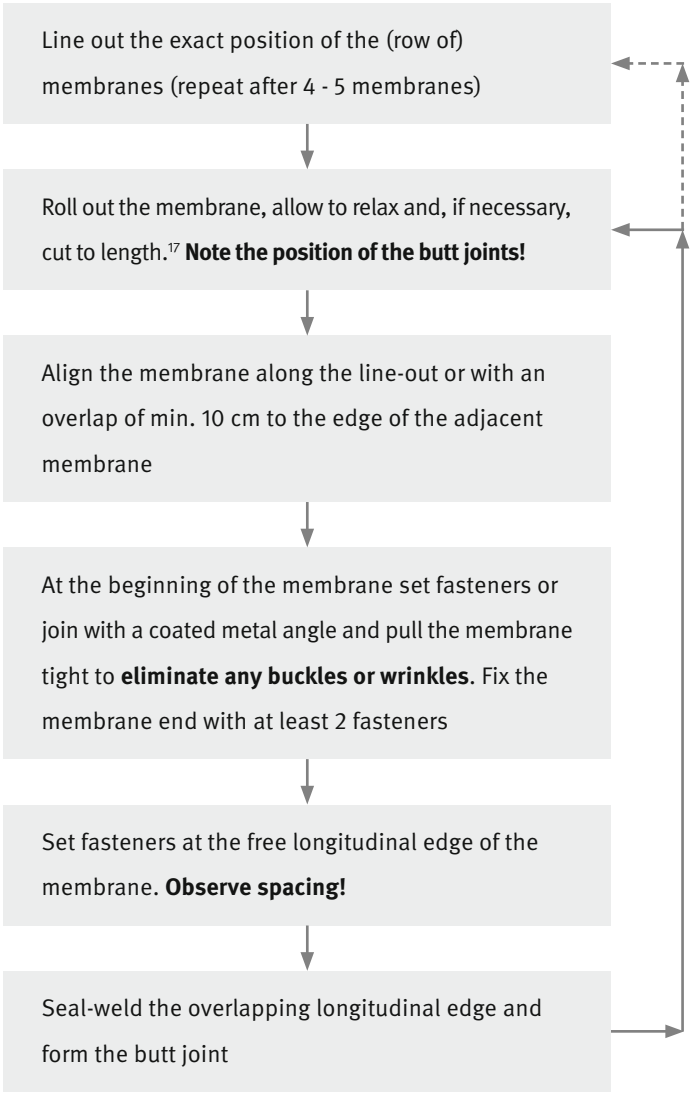
Prior to any application, fastening systems must be tested and certified. The selection of the fasteners (type, length) technologically depends on:

- the thickness of the build-up structure
- the material of the supporting substructure (profiled steel decking, timber deck, derived timber product, cement or lightweight concrete)
- the strength of the substrate
- the corrosion impact from the build-up structure (especially in the case of refurbishment)

The instructions of the fastener manufacturer are to be only **tread resistant fastening systems** must be used.

6.3.4 Mechanical fastening in the seam area

›› Installation scheme

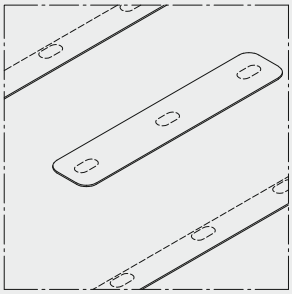

Line out the exact position of the (row of) membranes (repeat after 4 - 5 membranes)
Roll out the membrane, allow to relax and, if necessary, cut to length.[17] **Note the position of the butt joints!**
Align the membrane along the line-out or with an overlap of min. 10 cm to the edge of the adjacent membrane
At the beginning of the membrane set fasteners or join with a coated metal angle and pull the membrane tight to **eliminate any buckles or wrinkles**. Fix the membrane end with at least 2 fasteners
Set fasteners at the free longitudinal edge of the membrane. **Observe spacing!**
Seal-weld the overlapping longitudinal edge and form the butt joint

[17] See also 4.1 "Tips for installation".

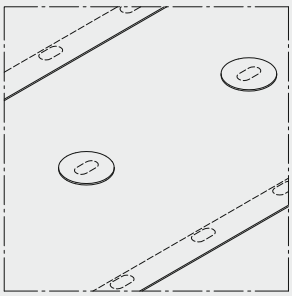
6 Laying methods and fixing of the roof waterproofing

Especially in corner areas, fasteners may be necessary outside the seam overlap, for example in the middle of the membrane. The fasteners outside the overlap area are covered by seal-welding

either in a row with unbacked tapes (16 cm wide)



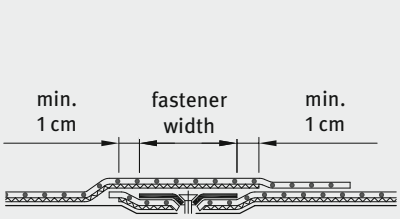
or individually with round unbacked details.

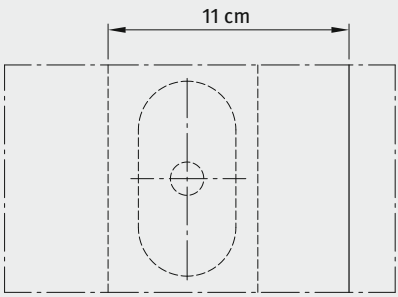


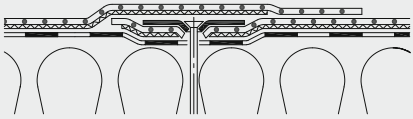
6 Laying methods and fixing of the roof waterproofing

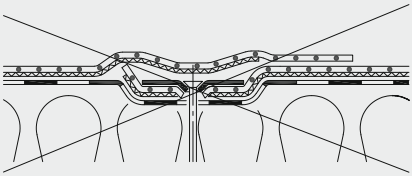
›› Position of the fasteners

Load distribution plates must be installed **at least 1 cm** from the edge of the backing, rectangular load distribution plates with the longer edge being **parallel to the membrane edge**.









The fasteners must be driven in only so far as to permanently prevent rotation of the load distribution plates and to ensure that the latter press the waterproofing membranes against the substrate without wrinkles.

6 Laying methods and fixing of the roof waterproofing

›› Use of setting tools

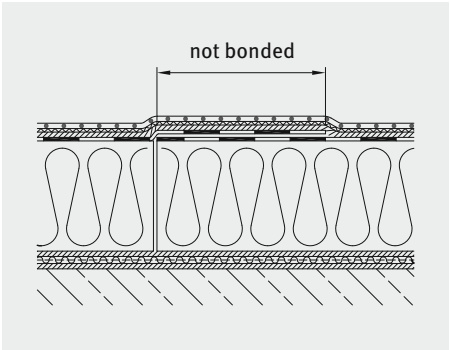
For an efficient and highly safe fastening in an ergonomical working position, setting tools may be used. Use only setting tools with a bit stop or a dynamometric clutch.

6.4 EVALASTIC® waterproofing membranes bonded

Bonding of the roof waterproofing is only recommended if loose laying with ballast, or mechanical fastening is not possible. Bonding of the roof waterproofing is only possible provided that **all underlying functional layers** are permanently **stationary** (Testing before refurbishment!).

For bonding, use fleece backed waterproofing membranes EVALASTIC® V or EVALASTIC® VGSK with a self-adhesive coating.[18] The laying of EVALASTIC® V waterproofing membranes is done either by rolling or folding, after applying the adhesive onto the substrate (generally, bituminous felt).

After removal of the separation foil, EVALASTIC® VGSK is laid as described in chapter 6.4.5. The limited mobility of the roof waterproofing resulting from the bonding makes it necessary to be especially careful when forming dilatation joints, flashings and cappings. Dilatation stresses deriving from the roof and the layer build-up must be absorbed without causing any damage.



Overlaps of membrane type backings at the joints of thermal insulation layers **must not be bonded.**

[18] In flashing areas, EVALASTIC® VSKA waterproofing membranes can be bonded to suitable substrates.

6 Laying methods and fixing of the roof waterproofing

Prior to expansion the roof waterproofing, non specially designed movement joints with a width of up to 5 mm are to be covered with a tape (sliding strip) with a width of 25 cm, fastened at one side.

After bonding, subsequent changes in the colour of the membrane surface cannot be excluded.

6.4.1 Preparing the substrate for refurbishment

The scope of the work necessary to prepare surfaces for refurbishment[19] depends on the existing layers or plies.

Existing bitumen covering with compressed gravel ballast

Cut open or completely scrape off blisters. Remove compressed gravel ballast with appropriate tools and level the substrate. Apply a compensation layer, e. g. a bituminous felt.

Existing bitumen covering under loose gravel ballast

Remove gravel ballast and bonded, tightly adhered pebbles with appropriate tools, e. g. ‘scabbler’ or roofing plane. If necessary, even the substrateby additionally torching the surface. Level any depression (e. g. removal of blisters or folds) by applying welding tapes.

Existing bitumen covering with a sand / grit coating

Cut open or completely scrape off blisters. Level any depression (e. g. removal of blisters or folds) by applying welding tapes.

Existing synthetic membrane roof sealing

Prior to bonding to existing synthetic membrane roof waterproofing, consult with the alwitra Technical Department is obligatory.

[19] Analysis of the roof build-up provided

6.4.2 Adhesives

Depending on the installation temperature (season), as well as on the type and characteristics of the substrate, the following adhesives are used:

›› cold-bonding adhesives

- solvent-containing synthetic adhesive alwitra L 40 rolled onto the complete surface
- moisture-curing single-component PUR adhesive alwitra PUR D, poured in lines (beads)

›› hot-melt bonding adhesives

- bituminous hot-melt bonding agent 85/25, 100/25 or 115/15, brushed onto the complete surface or poured in lines (beads), elastomeric bitumen hot-melt bonding agent, brushed onto the complete surface

Bituminous hot-melt bonding agent can only be used for **black** EVALASTIC® V waterproofing membranes (also at lower temperatures). On bituminous felts with a sufficiently thick bitumen coating, without sand or grit application, (e. g. bituminous welding sheet, min. 4 mm thick) or on bitumen beds, EVALASTIC® V waterproofing membranes can be bonded with **melt-on method**.

Cold-bonding adhesives require an **installation temperature of at least +5 °C.**

Note the instructions, especially with regard to

- the substrate conditions
- the installation temperature
- the quantities to be applied in the field,

perimeter and corner areas.

6 Laying methods and fixing of the roof waterproofing

If the adhesive is applied in lines, the roof waterproofing at the perimeter and at openings must be ensured in order to prevent wind uplift.

Prior to bonding to weathered substrates (refurbishment), a test bonding has to be carried out to determine the behaviour of the substrate and the required amounts of adhesive.

When applying adhesives, make sure that seam laps (welding area) and membrane joints in particular are kept clean from adhesive.

Fillers or other solvent-containing adhesive compositions are not suitable for bonding EVALASTIC® membranes.

6.4.2.1 Bonding with alwitra adhesive L 40

Technical data:

Base	styrene-butadiene rubber
Consistency	vicscous, rollable / brushable
Density	approx. 1.02 g/cm³
Shelf life	min. 24 months
Storage	dry and cool, protected against direct sunlight
Substrate temperature	from +5 °C to +80 °C
Ambient temperature	from +5 °C to +40 °C
Adhesive temperature	min. +10 °C
Open time	one-side bonding: approx. 10 to 15 min contact bonding: approx. 15 to 20 min

Substrate conditions:

stable, plain, dry, clean, free from dust, grease and oil, free from separating agents.

L 40 is suitable for bonding on many standard substrates such as concrete, light weight concrete or sanded, gritted or mineral-coated bituminous felt. Bonding on PUR / PIR rigid foam boards with L 40 is not permissible.

Application:

Thoroughly stir the adhesive in the container (25 kg or 9.5 kg).

The adhesive is applied

- on one side, rolled onto the complete surface in a grid pattern (one-side bonding)
- on two sides, rolled onto the complete surface in a grid pattern (contact bonding)

6 Laying methods and fixing of the roof waterproofing

Minimum quantity of alwitra adhesive L 40*

- **for one-side bonding**

	(g/m²)		
Building height[1]	**centre area / inner perimeter area**	**outer perimeter area**	**corner area**
up to 8 m	300	350	400
over 8 up to 25 m	350	450	500
over 25 m	on request		

[1] Buildings in wind zone WZ 1 + WZ 2 and terrain category II + III

- **for contact bonding**, e. g. at parapets and kerbs min. 450 g/m², at rough sheet piles min. 600 g/m².
- alwitra adhesive L 40 is only suitable for bonding of fleece-backed EVALASTIC® V waterproofing membranes.

The above-mentioned quantities must be increased depending on the substrate conditions, especially for rough and absorbent substrates (e. g. gritted bituminous felt). Excessive application of adhesive (adhesive clusters) on polystyrene rigid foam boards coated with a bituminous felt may lead to funnel shaped destruction of the rigid foam.

Before the membranes are rolled or folded onto the **adhesive**, allow for sufficient **airing** of the solvent to reduce the amount of volatile solvent trapped under the waterproofing membrane to a minimum. High amounts of solvent under the waterproofing membrane may lead to temporary blisters in the membrane which will again disappear, with the volatile solvents diffusing out. The airing time depends in particular on the ambient temperature and humidity.

* Minimum quantity according to DIN EN 1991-1-4.

6 Laying methods and fixing of the roof waterproofing

The so called **finger test** is the most practicable method for determining the right moment. If the finger test produces adhesive threads, bonding is still possible.

After rolling or folding the waterproofing membrane onto the adhesive, it must be immediately pressed on tightly with a broom.

The **position** of the waterproofing membrane **can be adjusted** immediately after it has been rolled or folded onto the adhesive alwitra L 40 **without impairing the adhesion**. Again press on tightly.

Always check the adhesiveness.

The equipment is cleaned with alwitra cleaner L 40, this must also be done before longer work breaks.

6.4.2.2 Bonding with alwitra adhesive PUR D

Technical data:

Base	1-component polyurethane prepolymer, moisture curing
Consistency	liquid, pourable
Density	approx. 1.10 g/cm³
Shelf life	min. 12 months
Storage	dry and cool, protected against direct sunlight
Substrate temperature	from +5 °C to +60 °C
Ambient temperature	from +5 °C to +40 °C
Adhesive temperature	min. +10 °C
Open time	approx. 20 min

Substrate conditions:

stable, plain, clean, free from dust, grease and oil, free from separating agents, slightly moist to dry. If the substrate is dry, air humidity is low and temperatures are high, moisten the substrate by spraying water fog (max. 15 g/m²)! [20] **Sanded, gritted or mineral-coated** bituminous felt.

Application:

one-side bonding, poured directly out of the container (5.5 kg / 2 kg) in lines (beads) [21], approx. 50 - 60 g/m per bead. **Allow for airing of the adhesive for approx. 5 - 10 minutes**, then before a film can form on the adhesive bead, roll or fold the membrane onto the PUR D adhesive beads and press on with a broom. **The width of the line** under the pressed-on waterproofing membrane must be **≥ 4 cm**.

[20] E. g. with an orchard sprayer.

[21] Warming in a water bath will increase flowability.

6 Laying methods and fixing of the roof waterproofing

Minimum quantity of alwitra adhesive PUR D*

	g/m² (number of lines/m²)		
Building height[1]	**centre area / inner perimeter area**	**outer perimeter area**	**corner area**
up to 8 m	200 (4)	200 (4)	300 (6)
over 8 up to 25 m	200 (4)	300 (6)	400 (8)
over 25 m	–		

[1] Buildings in wind zone WZ 1 + WZ 2 and terrain category II + III

For fast adhesive application (up to 8 beads simultaneously) with regular spacing, the use of PUR adhesive applicators (“application trolley”) is recommended.

The tools must be cleaned e. g. with acetone before the adhesive has cured.

After rolling or folding the waterproofing membrane onto the adhesive beads, it must be immediately pressed on with a broom.

You must **not correct the position** of waterproofing membranes after they are rolled or folded onto the PUR D adhesive beads, as this will significantly impair adhesion.

Adhesive beads may show through the waterproofing membrane.

PUR D is **only** suitable for bonding of EVALASTIC® V waterproofing membranes with a fleece backing on sanded, gritted or mineral-coated bituminous felts. Bonding on unbacked rigid polystyrene foam is not permissible.
PUR D is **not** suitable for bonding insulation materials.

* Minimum quantity according to DIN EN 1991-1-4.

6.4.2.3 Bonding with bituminous hot-melt bonding agent and by melt-on method

Technical data:

Base	oxidized bitumen		
Softening point	85 °C [1]	100 °C [1]	115 °C [2]
Penetration depth [0.1 mm]	25	25	15
Installation temperature	180 °C	200 °C	210 °C
Consistency at installation temperature	liquid		

[1] at roof slopes ≤ 3°
[2] at roof slopes › 3°

Substrate conditions:

- stable, plain, clean, free from dust, grease and oil, free from separating agents
- if necessary, with a bituminous priming coat

Application:

one-side full or partial brushed (brushing method) or poured application (pouring method)

Minimum quantity of adhesive*:

	(g/m²)		
Building height[1]	**centre area / inner perimeter area**	**outer perimeter area**	**corner area**
up to 25 m	200 - 400 (› 10 %)	400 - 600 (› 20 %) 1500 - 2000 (100 %) [2]	400 - 600 (› 40 %) 1500 - 2000 (100 %) [2]
over 25 m	on request		

[1] Buildings in wind zone WZ 1 + WZ 2 and terrain category II + III
[2] on mineral-fibre insulation boards with bituminous adhesive layer. Approval of insulation manufacturer required

* Minimum quantity according to DIN EN 1991-1-4.

6 Laying methods and fixing of the roof waterproofing

The bituminous hot-melt bonding agent, with an installation temperature according to the previous table, is poured or brushed onto the substrate. The EVALASTIC® V waterproofing membranes can be rolled or folded onto the hot-melt bonding agent directly, or later, when the bonding agent is remelted by torching.

In any case, **keep the upper side** of the membranes and the welding edges **clean** from bituminous hot-melt bonding agent; do not lay the membranes against the prevailing wind direction.

On bituminous felts with a sufficiently thick bitumen coating, without sand or grit application, or on bitumen beds, EVALASTIC® V waterproofing membranes can be bonded with **melt-on method**. The bitumen coating or bitumen bed is melted with a suitable tool over the whole width of the membrane and the EVALASTIC® V waterproofing membrane is rolled onto the melted bitumen and pressed on.

Correcting the position of a waterproofing membrane after it has been rolled or folded onto the bituminous hot-melt bonding agent **is not possible**. After partial bonding, the bituminous hot-melt bonding agent may show through the waterproofing membrane.

6.4.3 Suitability of cold-bonding adhesives

With cold-bonding adhesives, pay special attention to their suitability for contact with the substrate. On substrates which have a top separation layer, e. g. a PE foil or a talcum coating, you cannot use cold-bonding adhesives. Such separation layers may be applied to bituminous felt sand on membrane-shaped backings or bituminous adhesive layers of thermal insulation boards to avoid sticking of the material on the roll or transport piles [22].

Suitability of alwitra cold-bonding adhesives on	L 40	PUR D
concrete	+	+
lightweight concrete	+	++
render, brick work	++ [1]	–
steel sheet, aluminium	++ [1]	–
timber-based boards	+ [1]	–
bituminous sheets [2]	++ [1]	++
bituminous sheets, PE-foil, polyester fleece on the upper side	–	–
EPS / XPS rigid foam board unbacked	–	–
EPS rigid foam board, backed, glass fleece	–	–
EPS rigid foam board, backed, bituminous sheets [2]	++ [1]	++
PUR / PIR rigid foam board, unbacked, aluminium-laminated	–	–
PUR / PIR rigid foam board, mineral fleece backing	–	++
mineral fibre boards, unbacked	–	–
mineral fibre boards, bituminised	++ [1]	–
mineral fibre boards, with anorganic coating	+ [1]	–

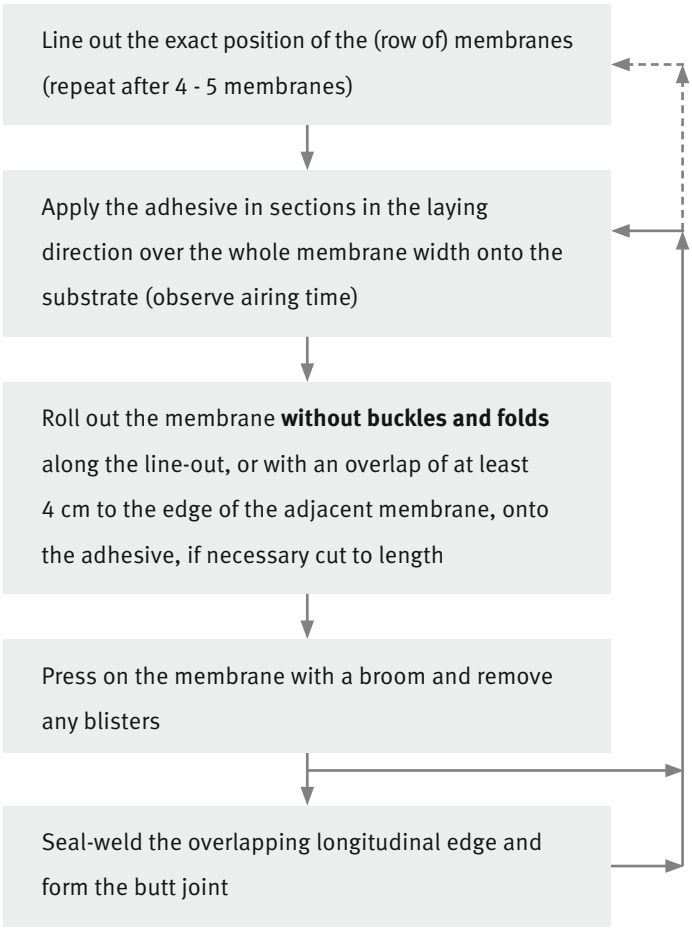
[1] also vertical surfaces (contact bonding) [2] sanded, gritted or with mineral-coated bituminous felt on the upper side
Legend: ++ especially suitable, + suitable, - not suitable

[22] Contact manufacturer for further information.

6 Laying methods and fixing of the roof waterproofing

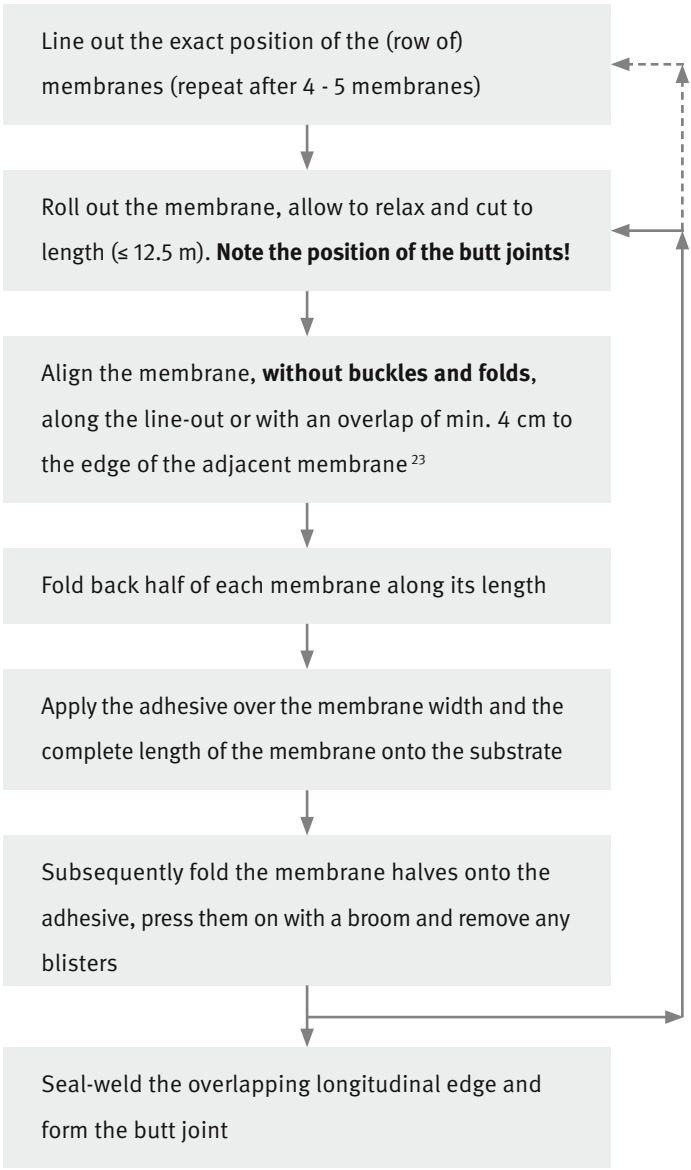
6.4.4 Installation scheme

›› Rolling method


Line out the exact position of the (row of) membranes (repeat after 4 - 5 membranes)
Apply the adhesive in sections in the laying direction over the whole membrane width onto the substrate (observe airing time)
Roll out the membrane **without buckles and folds** along the line-out, or with an overlap of at least 4 cm to the edge of the adjacent membrane, onto the adhesive, if necessary cut to length
Press on the membrane with a broom and remove any blisters
Seal-weld the overlapping longitudinal edge and form the butt joint

6 Laying methods and fixing of the roof waterproofing

›› Folding method


Line out the exact position of the (row of) membranes (repeat after 4 - 5 membranes)
Roll out the membrane, allow to relax and cut to length (≤ 12.5 m). **Note the position of the butt joints!**
Align the membrane, **without buckles and folds**, along the line-out or with an overlap of min. 4 cm to the edge of the adjacent membrane [23]
Fold back half of each membrane along its length
Apply the adhesive over the membrane width and the complete length of the membrane onto the substrate
Subsequently fold the membrane halves onto the adhesive, press them on with a broom and remove any blisters
Seal-weld the overlapping longitudinal edge and form the butt joint

[23] See also 4.1 “Tips for installation”.

6.4.5 Bonding with self-adhesive membranes EVALASTIC® VGSK

EVALASTIC® VGSK waterproofing membranes have a glass/polyester fleece backing and a synthetic adhesive compound coating. They are 25 m long and are produced with an approx. 5 cm wide unbacked welding edge on one side. The self-adhesive layer is bitumen- and solvent-free and covered with a protective foil when delivered.

Until installation, the EVALASTIC® VGSK membranes must be stored in a dark place or covered with tarpaulin. Holes in the lower separation foil must be covered to preserve the high adhesiveness of the self-adhesive layer.

Technical data of the self-adhesive layer:

Base	PSA adhesive, bitumen-free, solvent-free
Installation temperature	from +5 °C bis +40 °C
Storage	In a dry, cool and dark place
Shelf life	min. 12 months

The EVALASTIC® VGSK membranes are not suitable for the waterproofing of flashings or roof penetrations. **Perimeter fastening (see chapter 7) is obligatory.**

6.4.5.1 Bonding on unbacked EPS rigid foam boards

EVALASTIC® VGSK membranes can be directly **bonded to stable, unbacked polystyrene EPS rigid foam boards**. The substrate must be clean, dry and free from dust. The membranes are bonded directly to the thermal insulation **without any primer**. The lap width should be at least 6 cm (the self-adhesive layer will adhere to the overlapped membrane at a width of approx. 1 cm in the rear area), to avoid damage to the insulation material by hot air ingress. EVALASTIC® VGSK membranes can be applied, as described above, without any additional precautions at rated wind loads up to **2.5 kN/m²** (W_{res} according to DIN 1991-1-4).

6.4.5.2 Bonding on other substrates, e.g. bituminous sheets

The underside coating of the EVALASTIC® VGSK membranes adheres in connection with alwitra primer SK or SK-L (up to rated wind loads of **3.5 kN/m²**) to various standard substrates e. g. bituminous felt, concrete, zinc and steel sheets, aluminium and synthetic materials.

6.4.5.3 Application instructions for alwitra primer SK and SK-L

alwitra primer SK

Technical data

Base	solvent-free emulsion, bitumen-free
Consistency	liquid, rollable / brushable
Colour	blue
Installation temperature	min. +5 °C
Airing time	approx. 30 min [24] (after that, the roof area can be walked on)
Storage	dry, cool, frost-protected
Shelf life	min. 12 months

alwitra primer SK-L

Technical data

Base	SBS rubber, solvent-containing
Consistency	liquid, rollable / brushable
Colour	red
Installation temperature	min. +5 °C
Airing time	approx. 15 min [24] (after that, the roof area can be walked on)
Storage	dry, cool, frost-protected
Shelf life	min. 12 months

Substrate conditions:

stable, plain, clean, free from dust, grease and oil, free from separating agents

Application:

Thoroughly stir the alwitra-primer SK / SK-L in the container (25 L / 10 L). Apply evenly to the complete surface with a brush or a paint roller.

[24] The airing time to a great extent depends on the quantity applied, the materials and the weather conditions.

6 Laying methods and fixing of the roof waterproofing

Min. quantity of primer:

approx. 0.2 L/m² (wet, depending on the substrate). The applied quantities must be increased for rugged and absorbent substrates.

The primer must be completely dry before applying the EVALASTIC® VSKA membranes.

Note:

The alwitra primer SK-L dries faster in cool weather.

The condition of the bonding substrates and the necessity for precoating with alwitra-primer SK / SK-L (acc. to the table) may alter depending on the weather and construction site conditions. If necessary, a test bonding has to be carried out.

Substrate	Surface condition	alwitra primer SK / SK-L
Bituminous felt	PE foil / fleece	yes [1]
Bituminous felt	fine sand coating / talcum coating	yes
Bituminous felt	grit or fine slate coating	yes
Existing bitumen	weathered, dirty	yes
Synthetic membranes	weathered	no [2]
Concrete	slightly moist to dry, smoothed and well-cleaned, free from gravel clusters, burrs and sharp edges	yes
Steel / zinc sheets	degreased	yes [2]

[1] shortly torch with propane until the surface shows through in dark may be
[2] necessary depending on the type of material, to be tested in individual cases; generally, consultations with the alwitra Technical Department are obligatory.

6 Laying methods and fixing of the roof waterproofing

›› Installation scheme

Line out the exact position of the (row of) membranes (repeat after 4 - 5 membranes)

↓

Align the membrane **without buckles and folds** along the line-out or with an overlap of at least 6 cm to the grid pattern of the corresponding adjacent membrane and, if necessary, cut to length

↓

Tear off the separation foil at one end of the membrane, approx. 100 - 150 cm, fix the membrane end by bonding, pull the separation foil to one side from underneath the membrane, and at the same time press on the membrane with a wide broom over the whole width and remove any blisters

↓

Seal-weld the overlapping longitudinal edge and form the butt joint

Tear off the protective foil

Pull protective foil to one side and press on, removing any blisters

7 Perimeter fastening of the roof waterproofing

Perimeter fastening, which is also called perimeter fixing, is a mechanical fastening of the roof waterproofing along its perimeters and in the field area, regardless of the type of wind-uplift protection of the roof waterproofing (application method). It is designed to transmit the horizontal forces that may occur in the roof waterproofing into the supporting substructure. Perimeter fastenings can be carried out as line fastening or linear fastening.

7.1 Requirements

According to e. g. the Regulations for waterproofed roofs [25], perimeter fastening is necessary for

- loose laid single ply coverings
- profiled steel decks and
- roof build-ups with light surface protection and rigid foam thermal insulation, bonded with cold-bonding adhesives with after-tacking effect.

Perimeter fastening is generally recommended, especially in cases of drainage to bracket-mounted gutters on outer walls.

Perimeter fastenings must be installed

- at roof perimeters,
- at flashings of kerbs with an edge length over 25 cm,
- at structural expansion joints,
- at roof penetrations for single and arcade rooflights

as well as

- at valleys if the sum of the roof slopes is higher than 5 %.

[25] Regulations for Flat Roofs, section 2.6.1 (national regulations).

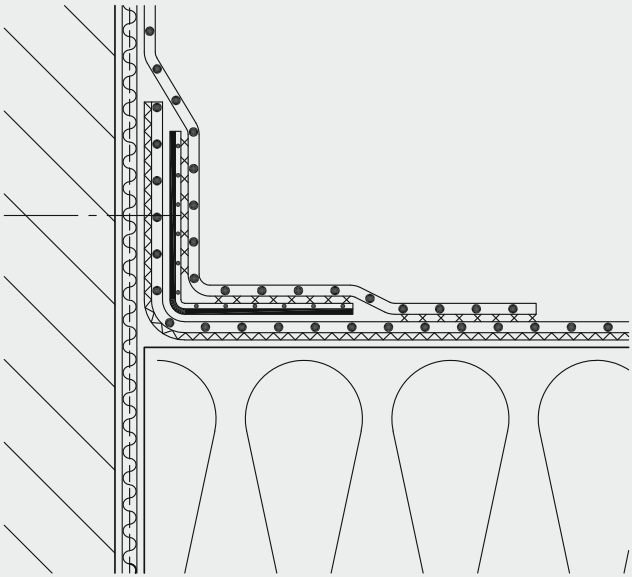
7 Perimeter fastening of the roof waterproofing

7.2 Line fastening

7.2.1 Line fastening with EVALASTIC® coated metal sheets

Line fastening of backed EVALASTIC® waterproofing membranes is primarily carried out with EVALASTIC® coated metal sheets. To do this, the edge of the membrane must be welded constantly to a mechanically fixed coated metal angle (“steel edge” of the roof waterproofing) [26] to ensure a non-positive connection.

For backed waterproofing membranes (EVALASTIC® V / VGSK) the non-positive connection is achieved by using an unbacked EVALASTIC® tape which **is welded to** both the waterproofing membrane and **at least the horizontal flange** of the coated metal angle up to the valley line.



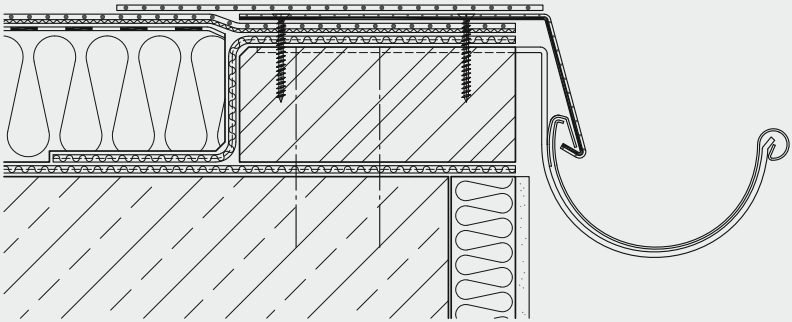
[26] Coated metal sheets are not clamping profiles!

7 Perimeter fastening of the roof waterproofing

At parapet valleys and valleys along kerbs, coated metal angles sheet (5 x 5 cm) are fixed to the parapet or the kerbs. The bottom fastening of the coated metal angles can be done directly into the substrate, or in case of thermal insulation layers, into battens which are sufficiently secured in the substrate. Coated metals sheets are to be fastened with non-corrosive screws or other suitable fastening elements [27].

Fastening of coated metal sheets in	with e. g.	spacing [cm]
reinforced concrete /	• SFS-Spike 4.8 x 25 mm	20
	• SFS-RNR 6.3 x 25 mm	20
solid brick	• body-bound rivet 4.8 / 26 mm	20
	• screws 4.5 - 6 mm with dowel	20
lightweight concrete	SFS-IGF-S-8.0 x 65 mm	20
steel sheeth	steel blind rivets 4 - 5 mm	10
solid wood or chipboard	wood screws 4.5 x 25 mm	20

A coated metal drip edge should be fastened with two rows of fasteners (generally, screws) and, if required, secured at the gutter bracket with the bracket clamp. Fasteners may show through the welded on tape.

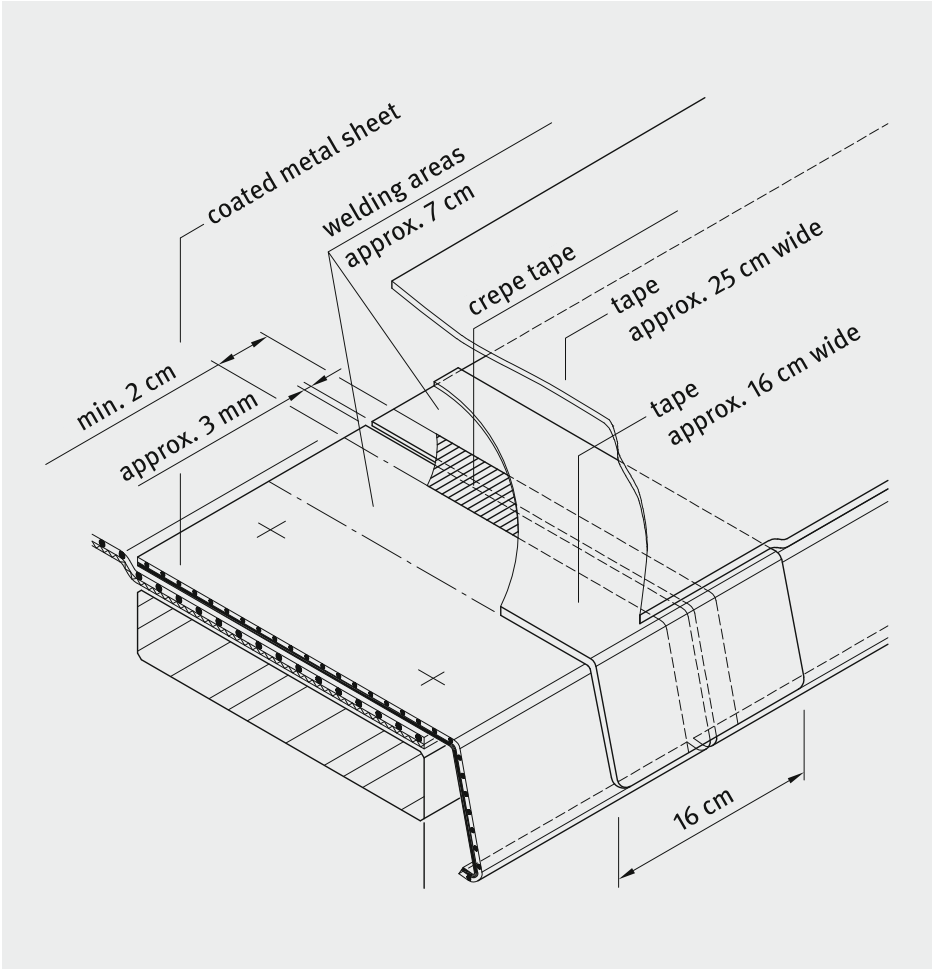


[27] Wire and clout nails, as well as so called gas concrete nails, are not suitable.

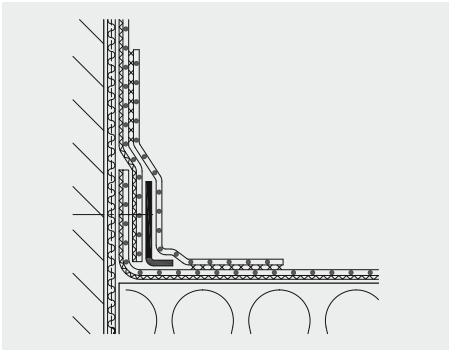
7 Perimeter fastening of the roof waterproofing

The **joints** of the coated metal sheets must be made in such a way that thermal expansion or contraction stresses arising from thermally induced changes are absorbed without causing damage.

In order to prevent welding in the joint area, all joints prior to the welding-on of the tape, which must have a width of at least 16 cm, will be covered with adhesive tape with a width of at least 2 cm (e. g. crepe tape).



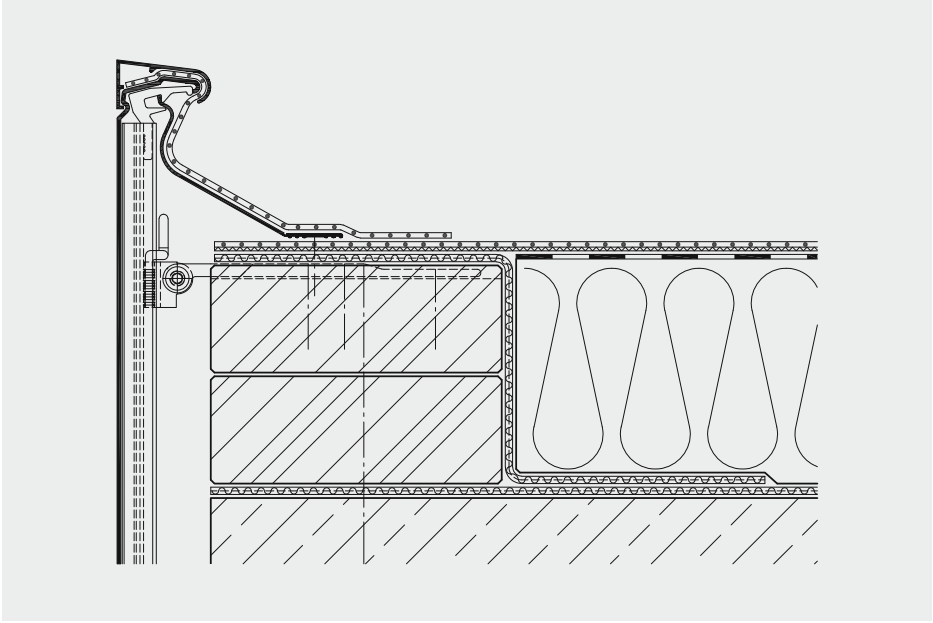
7.2.2 Line fastening with clamping bars (Peel-Stops)



If line fastening with **rigid clamping bars**, the bars must be waterproofed using an unbacked tape.

Fasten the clamping bars with at least 5 suitable fastening elements per metre onto the substrate or an auxiliary supporting substructure.

At roof perimeters with alwitra edge trim profiles (T plus / TW 125 plus / TA / TA-4F / TAG / art-line 1), the protection of the roof sealing against wind uplift is achieved by line fastening using the mechanically fastened supporting flange or the fillet plate of the roof edge trim.

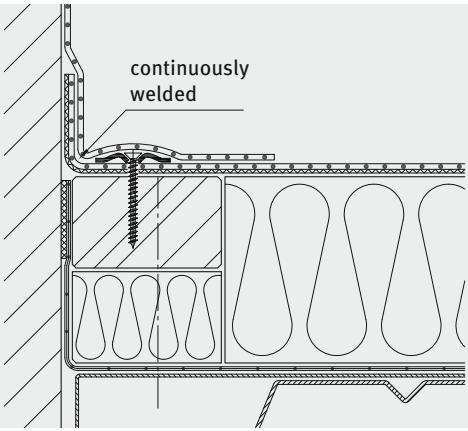


7 Perimeter fastening of the roof waterproofing

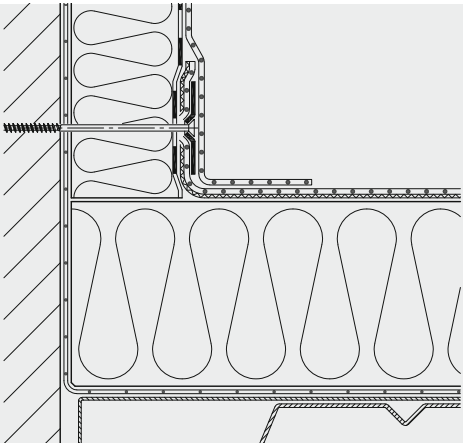
7.3 Linear fastening

7.3.1 Linear perimeter fastening using single fixings

The perimeter fastening can also be carried out by using single fixings in a row (linear fastening).



The perimeter fastening of EVALASTIC® waterproofing membranes can be done with approved membrane fasteners (min. 3 fasteners/m) set in a row.

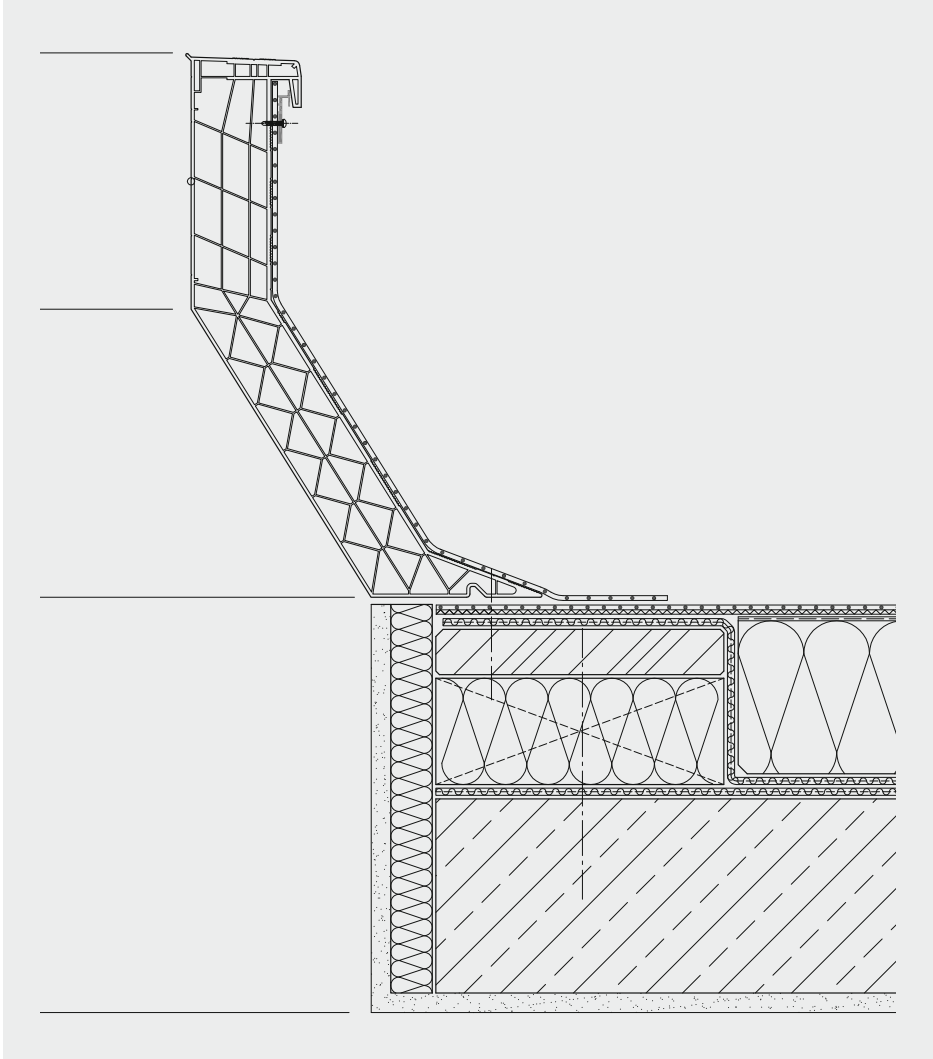


Generally, between the individual fasteners the flashing sheet must also be completely welded in the valley.

7 Perimeter fastening of the roof waterproofing

7.3.2 Linear perimeter fastening with alwitra kerbs

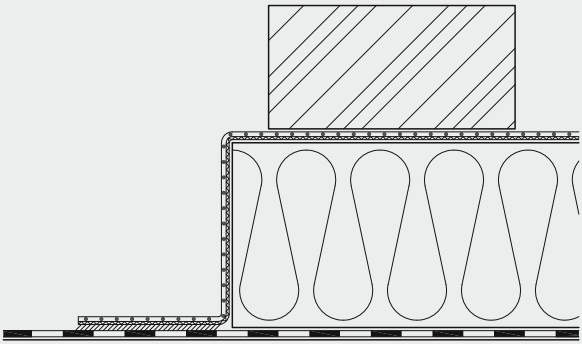
If, during installation, kerbs of alwitra daylight and smoke and heat vents are directly fastened on the roof waterproofing at waterproofing level and to the edge planks around the opening or to an adequately suitable construction, perimeter fastening of the roof sealing is ensured.



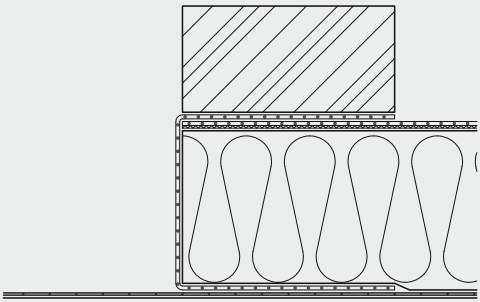
8 Temporary securing of the edge for interruption of work

Edges of roof sealing sections have to be secured against water ingress or wind uplift during work breaks, or at the end of the working day, until the work is resumed. This should be considered when determining the laying order.

On bituminous substrates (vapour control layers,existing roof sealings) securing of the edge canbe done by bonding (e. g. EVALASTIC® VSKA, if necessary, with alwitra primer SK or SK-L)along the edge and with ballast (e. g. water-proofing membrane rolls on timber battens) ont he waterproofing membrane.The bonding does not need to be removed when resuming the work and may serve as an insulation of individual roof areas.



On substrates such as vapour barriers consisting of foils on which bonding is not permissible, the temporary securing of the edge can be done with a folded-back membrane tape and additional ballast.



9 Installing maintenance walkways on the roof waterproofing

EVALASTIC® waterproofing membranes have a smooth surface to ensure fast drainage of rainwater and washing away of pollutants. If maintenance walkways are necessary on non-used roofs without ballast, they can be carried out by installing EVALASTIC® maintenance walkway tiles (800 x 600 x 9 mm). The textured surface provides a strong grip, even on sloped and wet areas. Moreover, the maintenance walkway tiles also provide for load distribution. Shifting of the maintenance walkway tiles even with increased wind loads is prevented by hot air welding the tiles to the EVALASTIC® waterproofing membranes.

Product design / dimensions:

Colour	dark grey; slight differences in colour possible
Surface	textured
Underside	even
Length x width	approx. 800 x 600 mm
Overall thickness	approx. 9 mm
Texture height	4 mm
Weight	approx. 8 kg/m² or approx. 3.7 kg/tile

Application:

The maintenance walkway tiles are welded to clean and dry roof areas covered with fleece-backed EVALASTIC® waterproofing membranes by hot air only (e. g. hot-air welding machine). It is recommended to install the tiles with a joint spacing of approx. 50 mm. On older and soiled roof surfaces the welding areas must be cleaned thoroughly with alwitra membrane cleaner. No additional fixing measures required.

10 Waterproofing of parapets

10.1 Waterproofing concept for the parapet

- Selection of membranes

  For the single ply waterproofing of parapets, unbacked EVALASTIC® waterproofing membranes or tapes of the required width (girth + min. 10 cm) are used. For full surface bonding you can also use backed EVALASTIC® V waterproofing membranes and self-adhesive EVALASTIC® VSKA tapes.

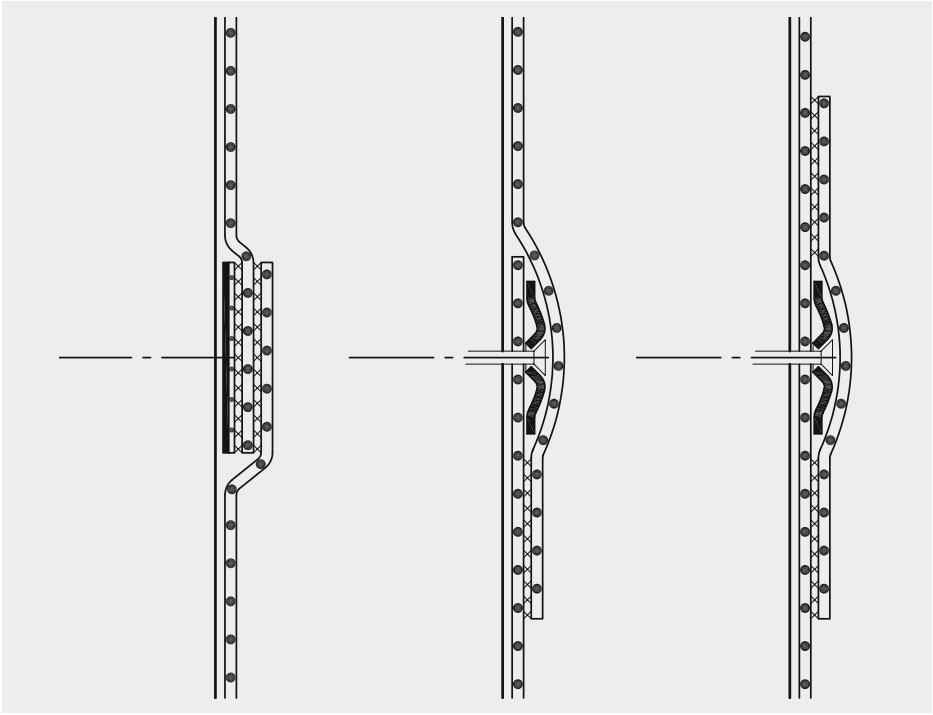
- The waterproofing of parapets is always carried out “separately” from the waterproofing of the centre area. The waterproofing of the centre area should be raised approx. 5 cm up the parapet.

- Protection against wind uplift: The edge of the waterproofing at the top of the parapet **must be sufficiently ensured against wind uplift**.

- The installation method and direction of the waterproofing membranes are to be determined depending on the characteristics of the building (height of the parapet, width of parapet top, building material, if necessary perimeter fastening).

10 Waterproofing of parapets

- For parapets up to 50 cm height, membranes can be loose laid without fixing on the wall. For parapets over 50 cm height, the membranes must be either fully bonded, or secured intermediately with EVALASTIC® coated metal sheets or single fasteners (max. vertical interval 50 cm).

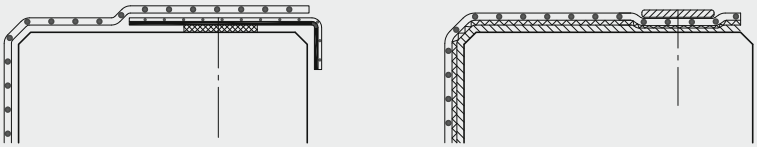


The spacing between the individual fasteners must not exceed 30 cm.

10 Waterproofing of parapets

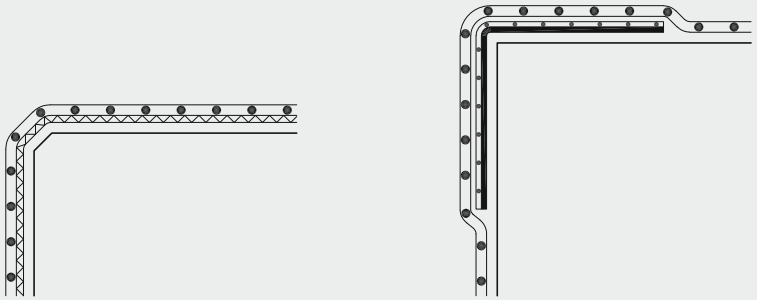
10.2 Protection against wind uplift

The edge of the roof waterproofing at the parapet must be sealed so as to be windproof. With loose laid membranes, this is accomplished by mechanically fastened EVALASTIC® coated metal sheet angles [28], whereas fully bonded membranes, depending on the building height and edge details (edge trim, capping), may be additionally mechanically fastened in line.



10.3 Edge protection of the roof waterproofing

Inner edges of the parapet must be shaped in such a way that the roof waterproofing can be applied without damage. EVALASTIC® V / VSKA membranes can be applied directly around cut-off edges. Non cut-off, sharp edges can be covered with a mechanically fastened EVALASTIC® coated metal sheet angle.



[28] E. g. by underlaying a strip of permanently elastic materials, especially at uneven substrates.

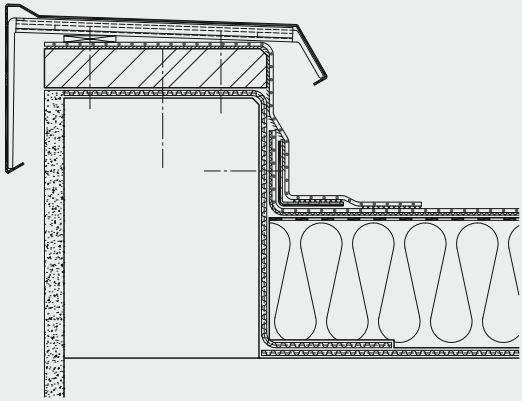
10 Waterproofing of parapets

10.4 Installation with VSKA tapes

EVALASTIC® VSKA tapes are membrane tapes with a polyester fleece backing and a synthetic adhesive compound coating. The coating is bitumen-free and solvent-free and covered with a protective foil when delivered. Until installation, the EVALASTIC® VSKA membranes must be stored in a dark place or covered with tarpaulin. Holes in the lower separation foil must be covered.

Technical data of the coating

Base	bitumen- and solvent-free PSA adhesive
Installation temperature	from +5 °C to +40 °C
Storage	dry, cool, protected against light
Shelf life	min. 12 months



EVALASTIC® VSKA tapes are produced with a non-coated approx. 12 cm wide welding edge on both sides (tape width 86 cm / 66 cm), or on one side (tape width 43 cm / 33 cm). Thus, a homogeneous welding of the EVALASTIC® VSKA tapes to the roof sealing and the coated metal sheet angle is guaranteed.

10 Waterproofing of parapets

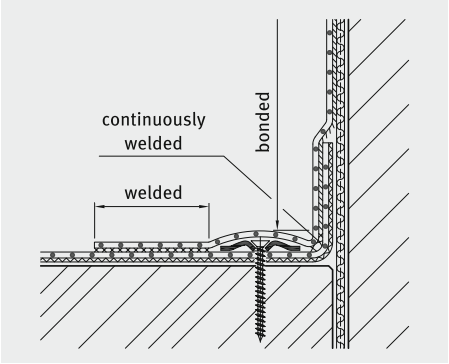
The underside coating of the EVALASTIC® VSKA tapes, in connection with the alwitra primer SK or SK-L (see chapter 6.4.5.3), adheres to all standard building substrates at the roof perimeter or wall flashing area, e. g. timber, concrete, bituminous felt,brick work, zinc and steel sheets, aluminium or synthetic materials. Depending on the substrate, the coating may show at the membrane surface.

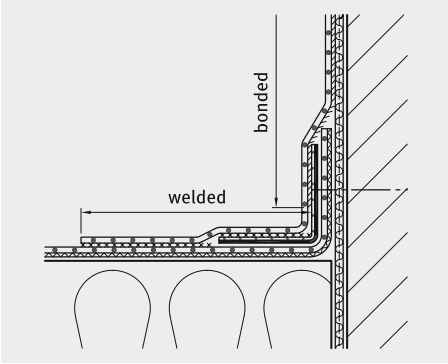
EVALASTIC® VSKA tapes can be installed at temperatures over +5 °C. Substrates must have a stable, plain surface, they must be dry and free from grease and oil. A bonding facilitator of alwitra primer SK or SK-L is to be applied onto the substrate (see application instructions in chapter 6.4.5.3). The primer must be completely dry before applying the EVALASTIC® VSKA tapes.

Test bonding is obligatory!

Place the EVALASTIC® VSKA tapes in the correct position. Make sure that the non-coated welding edge is aligned so as to be homogeneously welded to the roof waterproofing after applying the tape. Remove the lower protective foil. Slightly press on the tape to remove any blisters. Then press on thoroughly to ensure reliable adhesive bonding.

Cross joints must be welded over with an unbacked tape. Appropriate measures must be taken to make the upper end of the EVALASTIC® VSKA tapes rainproof.





10 Waterproofing of parapets

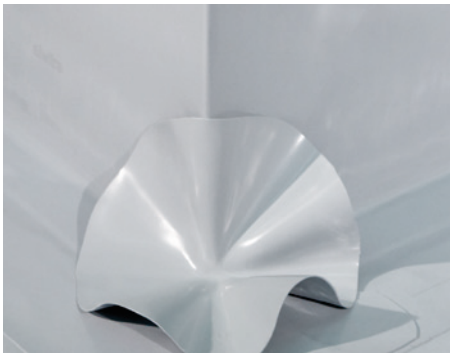
10.5 Installation of corner waterproofing

The membranes must be laid so **as to have as little covering layers lying on top of each other as possible** at the parapet corners. Membranes laid parallel to the parapet are butt together at the corner areas or laid around corners. The lap width at the butt joint should be approx. 10 cm.

If corners are formed with EVALASTIC® preformed details, they are to be welded with hand-held hot-air guns.

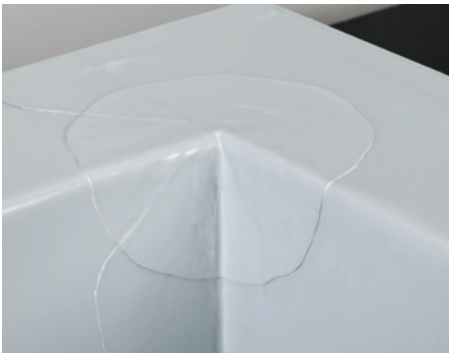
10.5.1 External corners (parapet / upstand – valley area)

- with EVALASTIC® preformed detail



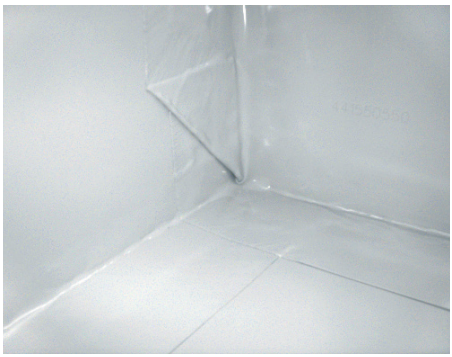
10.5.2 Internal corner (inner top side of the parapet)

- with EVALASTIC® performed detail

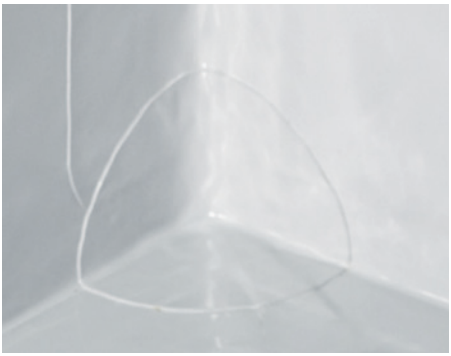


10.5.3 Internal corners

- continuous membrane, folded and welded



- with EVALASTIC® preformed detail



11 Flashing to upstands - wall flashing

Flashings to upstands are carried out after laying the field membranes with

- unbacked EVALASTIC® tapes,
- self-adhesive EVALASTIC® VSKA tapes
- bent EVALASTIC® coated metal sheets

11.1 Required flashing height of the roof waterproofing [29]

The required flashing height above the roof waterproofing or the surface paving of non-utility or utility roofs respectively (e.g. gravel layer, walkway / driveway paving or vegetation) is:

≥ 15 cm at a roof slope up to 5° (8.8 %)
≥ 10 cm at a roof slope › 5°

At door areas, it is possible to reduce the flashing height to a minimum of 5 cm, provided that unimpeded water drainage is ensured.

[29] The corresponding national regulations apply.

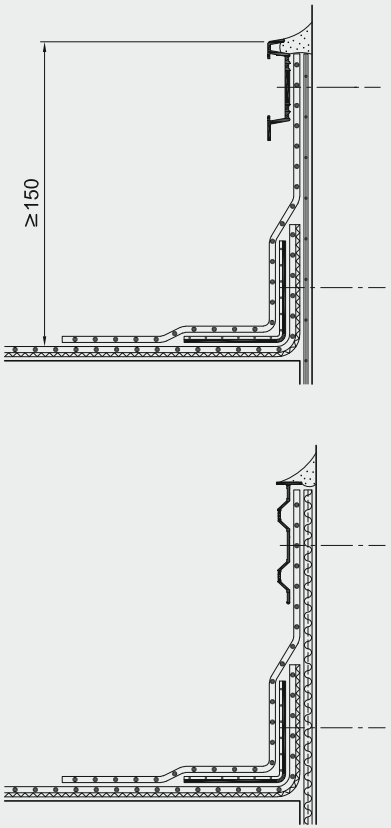
11 Flashing to upstands - wall flashing

11.2 Laying of tapes

Flashing sheets with a length of up to 25 m are laid at the required flashing height along the upstand and in the valley to the field area and are welded to the roof waterproofing. Vapour barriers are to be raised to the top edge of the tape.

Unbacked EVALASTIC® tapes are loose laid [30]

- and continuously pressed on along the top edge by alwitra wall flashing profiles
- on raised vapour barriers consisting of synthetic membranes, e. g. PE foils,
- on kerbs which are not rigidly connected to the supporting substrate and
- if line fastening with EVALASTIC® coated metal sheets is installed in valleys.



[30] With loose laid tapes, slight buckling cannot be excluded.

11 Flashing to upstands - wall flashing

EVALASTIC® VSKA tapes (see chapter 10.4) are fully bonded to the kerb on suitable substrates and at the upper edge continuously pressed on by alwitra wall flashing profiles or other suitable means.

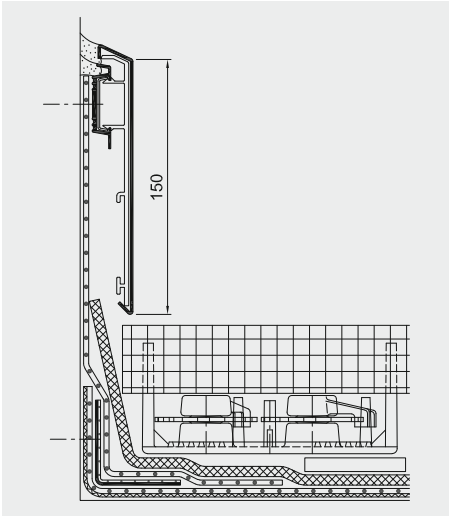
The joint between the kerb and the wall flashing profile should be waterproofed with a permanently elastic and weatherproof joint sealant, using a suitable primer, if necessary.

The installation of corner waterproofing is to be made according to chapter 10.5.

11.3 Protection of the tape

On used roofs (roof gardens, terraces, carparks), the roof waterproofing at the skirting must be protected against mechanical damage, also above the gravel layer, the pavement or road surface.

This can be achieved by the easy-to-install overhang profile for the alwitra wall flashing profile WA 1 - ÜK or the profile WA 150. A protection layer consisting of building-protection mat [31] or similar must be installed between the pavement and the roof waterproofing at the kerb.



[31] E. g. "KRAITEC protect" company Kraiburg, Salzwedel, Germany or "Regupol 9510", BSW, Bad Berleburg, Germany. Use of other building-protection mats can possibly lead to slight staining and embossing at the surface of the waterproofing membranes.

11 Flashing to upstands - wall flashing

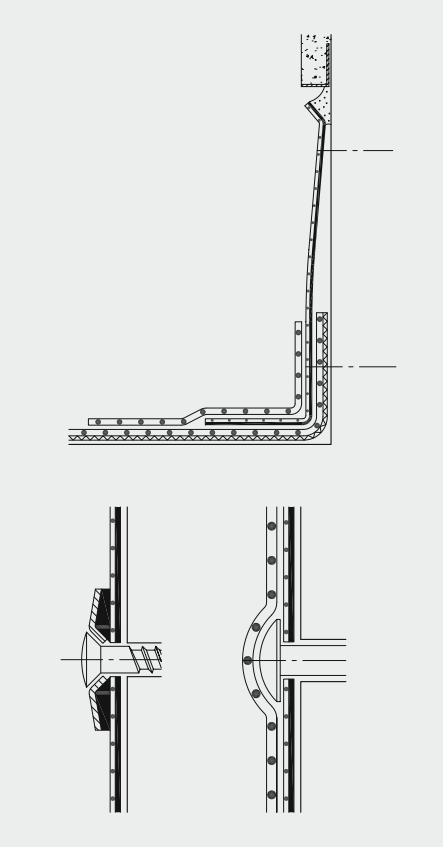
11.4 Wall flashing with EVALASTIC® coated metal sheet

Flashings to upstands can be carried out at low cost using mechanically fastened EVALASTIC® coated metal sheets (approx. 20 cm girth, 2 bends), if line fastening is required in the valley (see chapter 7.1). Also at door areas, the flashing can be carried out best with coated metal sheets.

The connections at the joints and the fixings at the upstand must be watertight, allowing the sheets to expand and contract without damage.

The fixings, with a spacing of e ≤ 20 cm at the upstand, must be either self-sealing[32] or must be covered with a seal-weld EVALASTIC® tape.

The joint between the upstand and the coated metal sheet should be sealed with a permanently elastic and weatherproof joint sealant, using a suitable primer, if necessary. To do this, the sheets must be bent at the top edge with a side of at least 10 mm width.



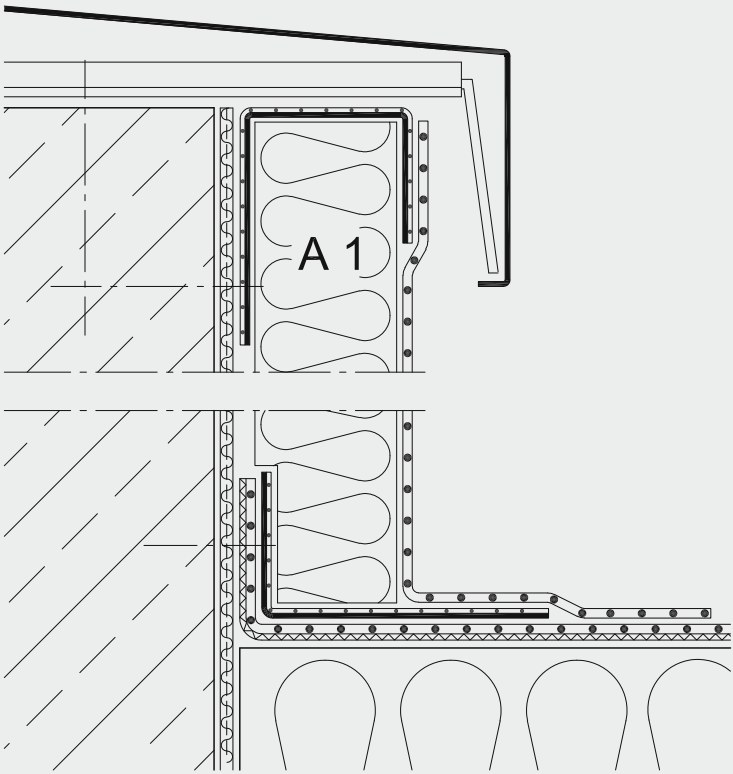
[32] E. g. self-sealing stainless steel screw-washer-assemblies (“plumber screws”).

11 Flashing to upstands - wall flashing

11.5 Flashing to firewalls [33]

Walls for the separation or segregation of fire sectors (firewalls) must consist of non-combustible building materials (class A). In order to avoid thermal bridges (cooling ribs), they should be insulated above the roof level with non-combustible building materials.

You must not lay the covering over the crown of the firewall. It is recommended to loose lay unbacked EVALASTIC® tapes of the required width (height + min. 10 cm) along the firewall and weld them to mechanically fastened EVALASTIC® coated metal sheets.

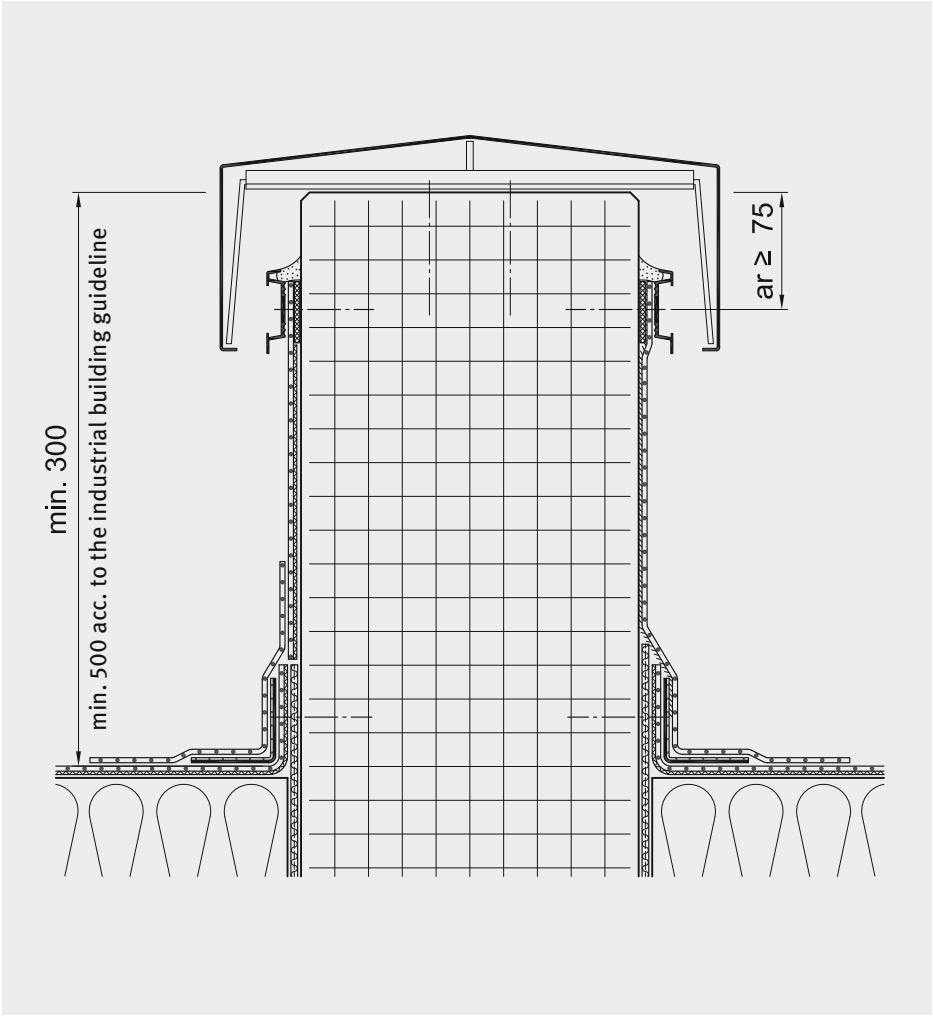


[33] The corresponding national regulations apply.

11 Flashing to upstands - wall flashing

At non-insulated firewalls made of e. g. lightweight concrete or other non-combustible materials, self-adhesive EVALASTIC® VSKA tapes are fully bonded, fixed at the top edge against sliding away and made rainproof.

With mechanical fixing, keep the required edge distance, in particular with lightweight concrete (min. 75 mm).



12 Waterproofing of expansion joints and connection to other types of roofing

12.1 Waterproofing of expansion joints

Waterproofing of **type I** joints (DIN 18531):

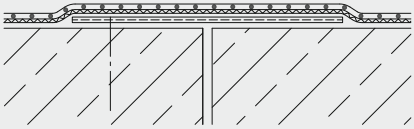
Over the joint, the roof waterproofing can be laid flat in a single ply. The waterproofing over the joint must be supported by applying suitable measures like support plates so as to prevent the covering from sinking into the joint gap.

Roof waterproofing made of **bonded** EVALASTIC® waterproofing membranes may also be installed flat over joints moving up to **5 mm**. At least 0.2 m wide sliding strips must be placed under the waterproofing.

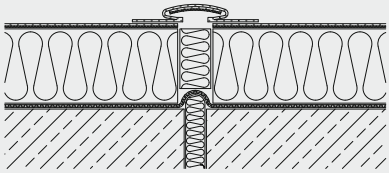
With **loose laid** EVALASTIC® waterproofing membranes the roof waterproofing can be installed over joints with a expansion of up to **10 mm**, provided the membranes are supported in the joint area.

Waterproofing of **type II** joints (DIN 18531):

Depending on the extent and the frequency of joint expansions, the type of waterproofing is to be decided upon individually, e. g. by installing loops of suitable waterproofing materials with EVALASTIC® membranes and round profiles (for expansions up to 25 mm and a joint width up to 30 mm).



Waterproofing of expansion joints with loose laid EVALASTIC® waterproofing membranes

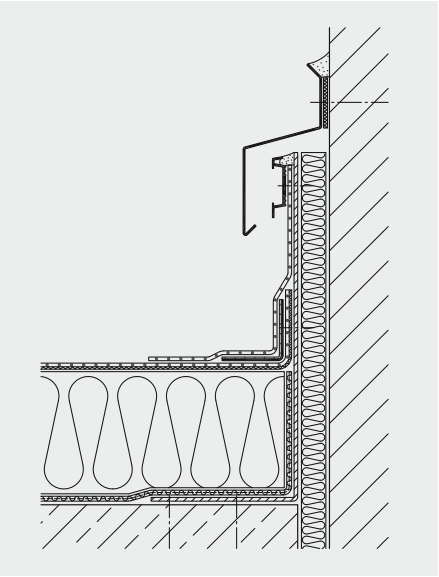


Installing loops of suitable sealing materials, with EVALASTIC® membranes and round profile

12 Waterproofing of expansion joints and connection to other types of roofing

Type II joint waterproofing may be raised over the waterproofing level, e. g. by placing wedge-shaped insulation elements or with cants. Roof areas separated by raised formations must have independent drainage.

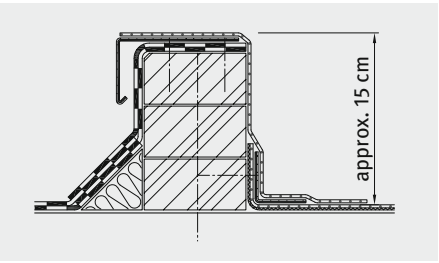
If expansion joints in the flashing area to kerbs (e. g. annexes) are inevitable, appropriate constructive measures like installation of support plates (min. 1.5 mm) are required.



12.2 Installation of a flashing to roof waterproofing made of different material

Roof waterproofing consisting of EVALASTIC® waterproofing membranes are compatible with all standard waterproofing materials. It is not possible, however, to ensure permanent waterproof connection to these materials (except for some liquid plastics [34]). Professional flashings to roof waterproofing which are made of different material can be installed only along high points of the slope (arris).

Roof waterproofing which cannot be connected so as to be water tight should be raised above the water drainage level by approx. 15 cm, jointly fastened mechanically and covered so as to be watertight.



[34] Producers of liquid sealants on request.

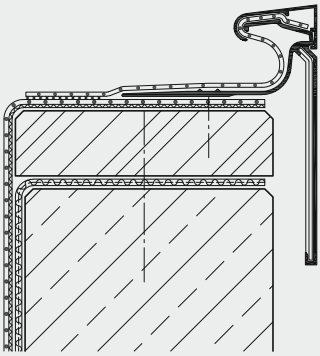
13 Flashing of edge trim profiles and integrated details

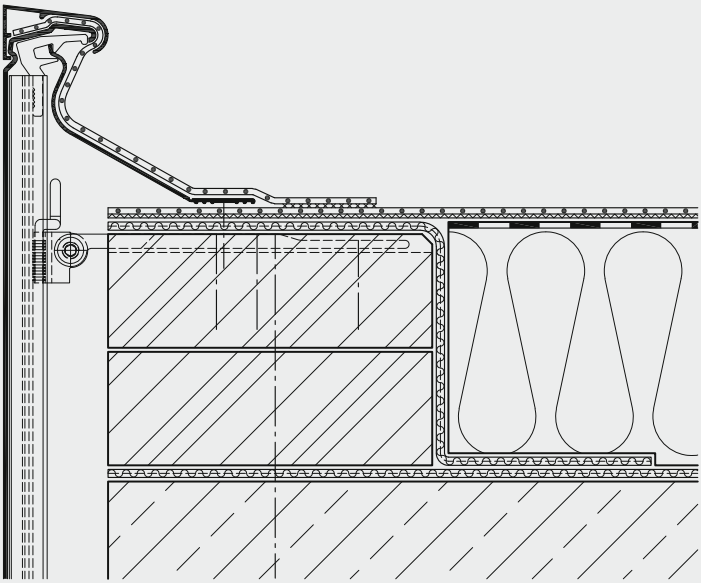
13.1 Flashing of roof edge trim profiles

The flashing of alwitra roof edge trim profiles (T plus / TW 125 plus / TA / TA-4F / TAG / art-line 1) and other industrially manufactured edge trim profiles is carried out with unbacked EVALASTIC® tapes (e. g. 25 cm or 33 cm wide).

The tapes are kept in place in the profile along one edge and seal-welded to the roof waterproofing at the other edge, with an overlap.

Tapes at roof trim edges, which are installed at crescent-shaped roof perimeters, should be cut to fit the curve.





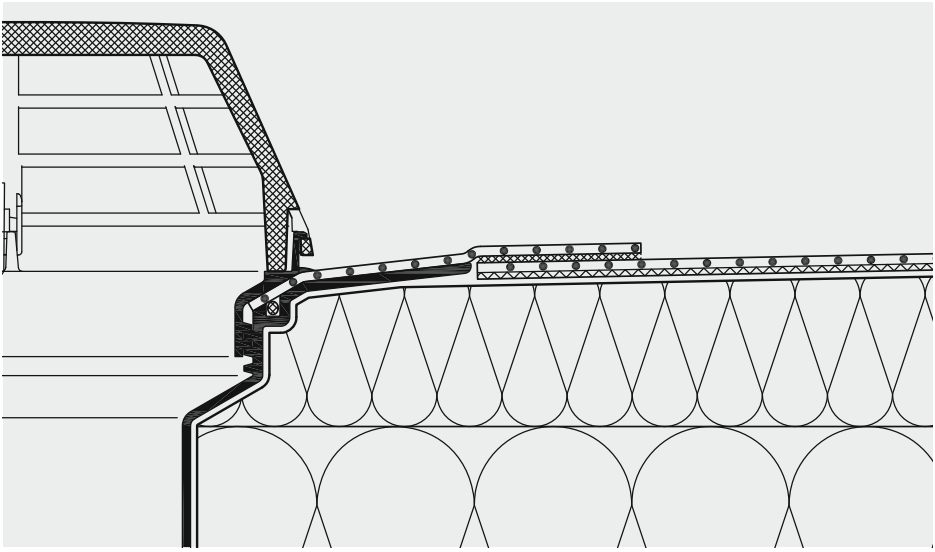
13 Flashing of edge trim profiles and integrated details

13.2 Flashing of alwitra rainwater outlets, emergency outlets and vents

›› Flashing of alwitra rainwater / emergency outlets

Flashing of alwitra rainwater outlets, emergency outlets and extension pieces is carried out with a custom-fit unbacked EVALASTIC® connecting flange. The connecting flange is fastened to the drainage element using the corresponding screw ring. Therefore, check integrity and correct position of the oval gasket below the screw ring and, prior to installing the connecting flange, apply a thin film of lubricant to the gasket including the adjacent waterproofing surfaces at the flange.

Then the collar fastened with the screw ring is to be fully welded to the flange of the rainwater outlet, emergency outlet or the extension element. Subsequently, the collar is seal-welded along the outer edge to the fixed roof sealing [35].



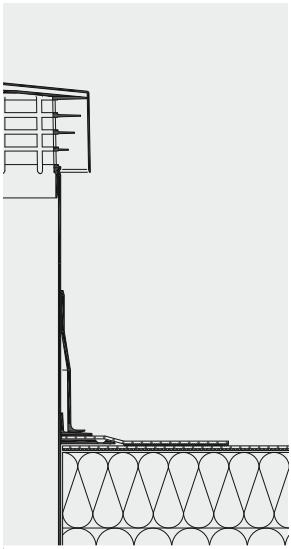
[35] Position stability of integrated details must be secured.

13 Flashing of edge trim profiles and integrated details

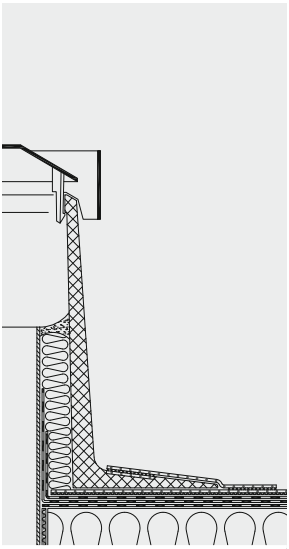
›› Flashing of alwitra vents

For easy and reliable flashing to the roof sealing, alwitra vent stacks and alwitra cold roof vents are equipped with a factory-fitted EVALASTIC® flashing strip. The factory-fitted connecting flange is to be seal-welded along its outer edge to the fixed roof waterproofing.

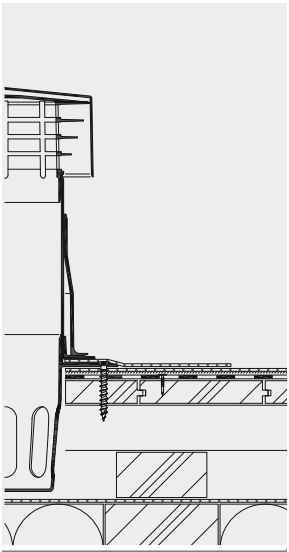
After fastening the alwitra refurbishment vent to the supporting construction, the ring-shaped unbacked EVALASTIC® connecting flange, which fits the corresponding vent type, is seal-welded along the inner edge to the foamed-in EVALASTIC® flashing strip of the alwitra refurbishment vent, and along the outer edge to the fixed roof waterproofing.



alwitra vent stack (2 parts)



alwitra refurbishment vent



alwitra cold roof vent

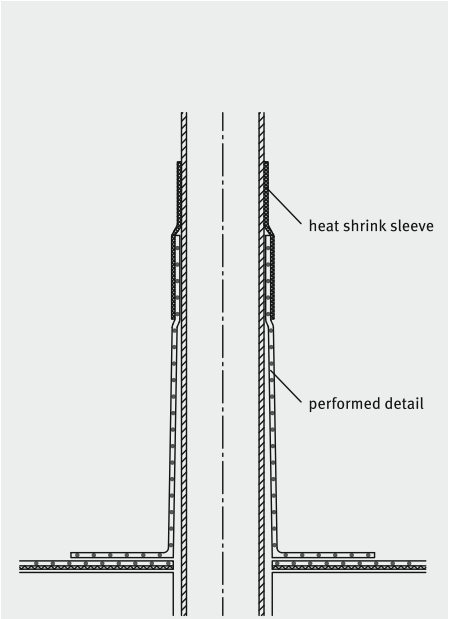
13 Flashing of edge trim profiles and integrated details

13.3 Flashing of roof penetrations with EVALASTIC® sleeves

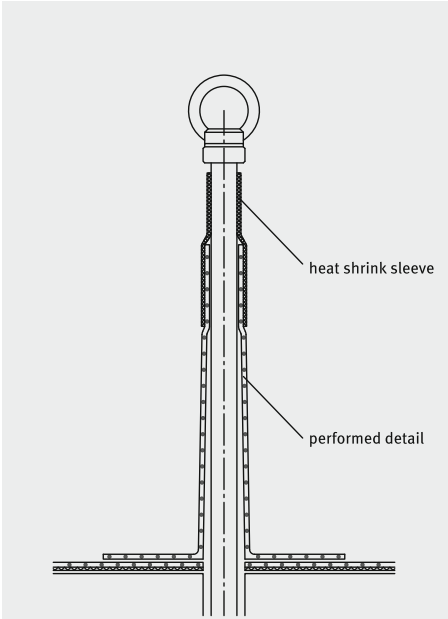
Flashing of roof penetrations to the roof waterproofing (e. g. cable or lightning conductor inlets, safety barriers and other round penetrations) is carried out with preformed EVALASTIC® sleeves.

Place the EVALASTIC® sleeves on the roof penetration so that the collar will bear on the EVALASTIC® waterproofing membrane. Then, homogeneously weld the collar with hot air at a width of at least 2 cm around the outer edge to the roof waterproofing.

Put a heat shrink sleeve approx. 5 cm on the preformed detail (EVALASTIC® sleeve) and heat it with hot air until it solidly seats / adheres to the integrated detail and the preformed detail.



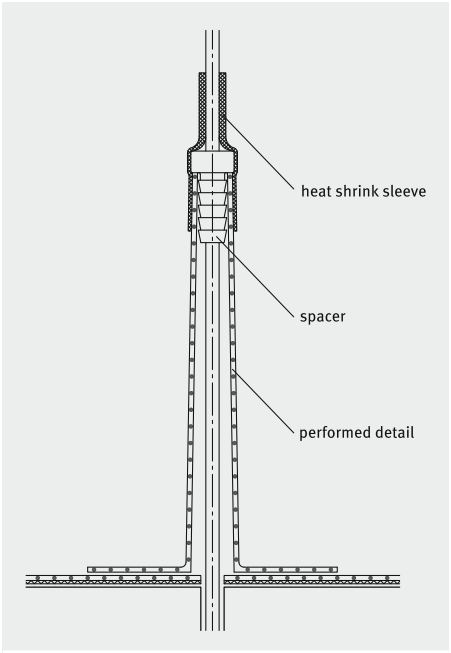
Penetration diameters
Ø 50 mm, Ø 80 mm, Ø 110 mm



Penetration diameters
Ø 18 mm, Ø 26 mm

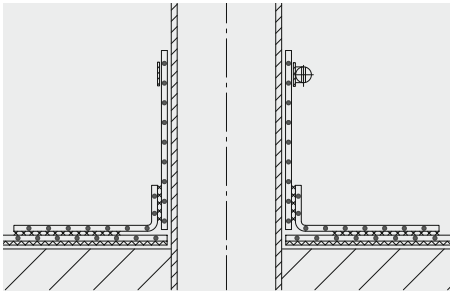
13 Flashing of edge trim profiles and integrated details

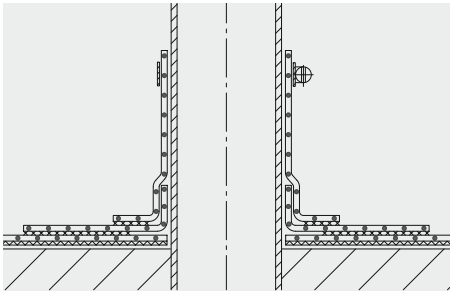
At roof penetrations with a diameter of approx. 8 - 10 mm (e. g. lightning conductor), prior to placing the heat shrink sleeve, the spacer (included with the parts for sleeves Ø 18 mm) must be installed between the roof penetration and the preformed detail according to the illustration.



Penetration diameters Ø 8 - 10 mm

13.4 Flashing of roof penetrations with cut-to-size sleeve from unbacked EVALASTIC® material, 1.5 mm thick





Homogeneously weld the collar at a width of min. 2 cm all around the outer edge to the roof waterproofing, install a stainless steel pipe clamp on the sleeve to make it rainproof.

13 Flashing of edge trim profiles and integrated details

13.5 Flashing of kerbs of alwitra roof lights and natural smoke vents

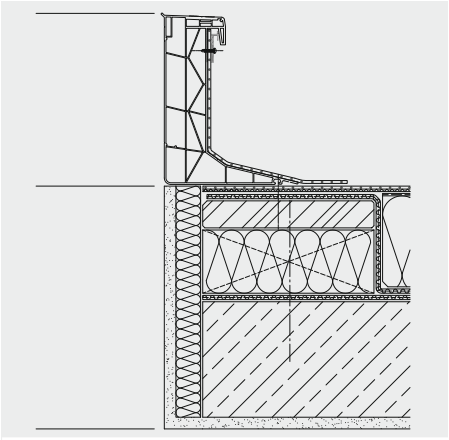
›› Kerbs with collar

In the case of kerbs with a factory-equipped EVALASTIC® collar, the collar is directly welded to the roof waterproofing after installing the kerbs.

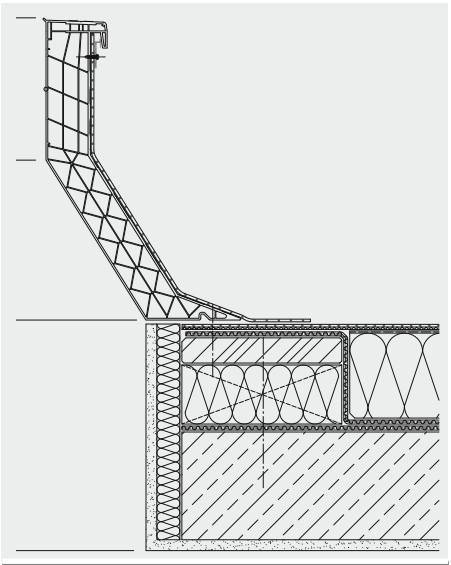
›› Kerbs without collar

The kerbs have to be sealed to the upper edge e. g. with self-adhesive EVALASTIC® VSKA tapes, incl. necessary forming of corners with cut-to-size EVALASTIC® tapes or preformed corners. The flashing sheets are to be welded to the roof waterproofing.

At the upper edge the flashing must be fixed against sliding away and covered to make it rainproof.



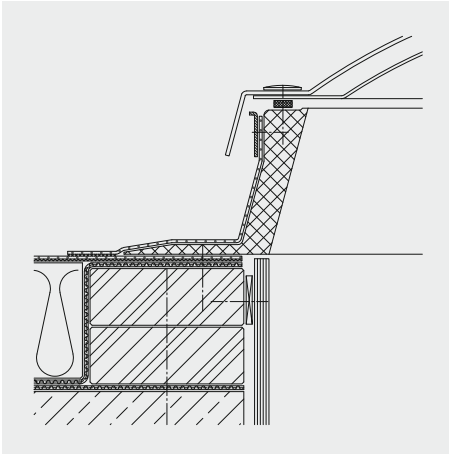
Sealing of kerb 1600



Sealing of kerb 3020

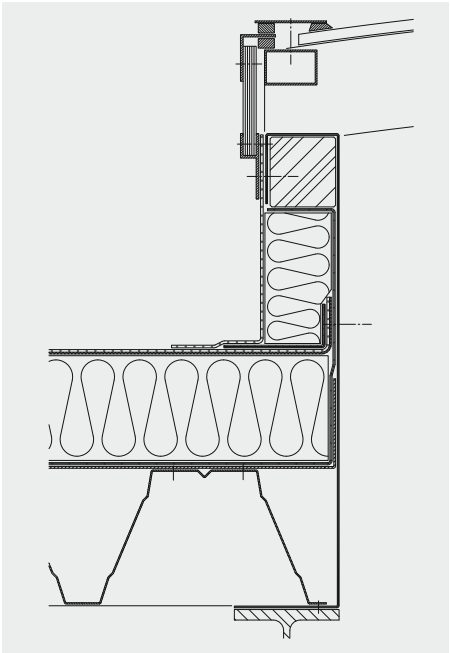
» Flashing of other rooflights and natural smoke vents

Other kerbs must be coated up to the dome around the circumference with self-adhesive EVALASTIC® VSKA tapes (bonded), fixed on the top edge against sliding away and covered to make them rainproof.



13.6 Flashing of arcade rooflights to the roof waterproofing

Flashings of arcade rooflights are either carried out like wall flashings (see chapter 11), or unbacked EVALASTIC® tapes or self-adhesive EVALASTIC® VSKA tapes are integrated into the arcade rooflights structure [36].



[36] To be confirmed with the manufacturer of the arcade roof light.

14 Securing the position of lightning conductor holders

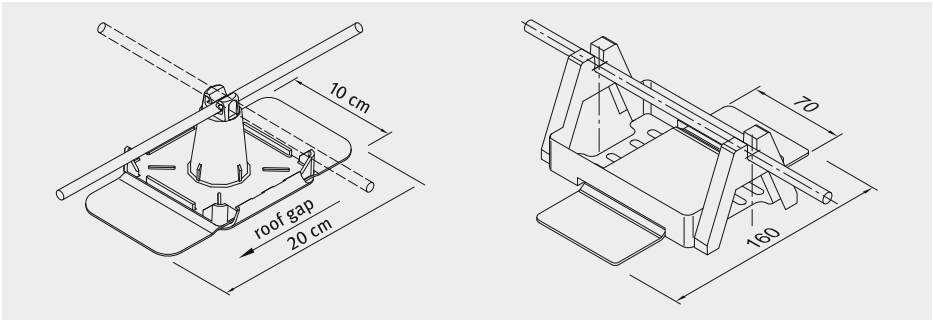
EVALASTIC® waterproofing membranes have a very smooth surface, so that holders must be secured against sliding away or shifting

- on roof slopes of approx. 5 % and more or
- if the membranes are loose laid and mechanically fastened.

The following methods for securing are available

- EVALASTIC® tapes, with rounded off corners, arranged in direction of the slope which are conducted through the holder[37] and welded at their ends to the roof waterproofing with an overlap.

On mechanically fastened waterproofing membranes, the lightning conductor holders are positioned directly next to the membrane fasteners.



[37] E. g. “type KF” from DEHN + SÖHNE in 92306 Neumarkt/Opf., Germany.

15 Forming of EVALASTIC® coated metal sheets

EVALASTIC® coated metal sheets:

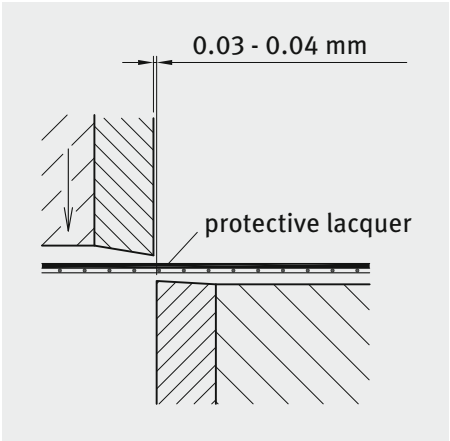
- steel sheets, 0.6 mm thick, galvanised
- coated with a light-grey protective lacquer (10 µm thick) on the back side
- laminated on the top side with 0.6 mm EVALASTIC®
- sheets (1 m x 2 m)
- overall thickness 1.2 mm

Coated metal sheets are packed in the factory and transported on pallets. They must be stored horizontally on a dry and plain area.

The forming (cutting, bending) of coated metal sheets should be done at room temperature (approx. 18 °C).

15.1 Cutting

The coated metal sheets should be cut with sharp tools with the **protective lacquer coating up**. This makes a deburring of the sheets unnecessary. The cutting clearance should be 0.03 mm to 0.04 mm.



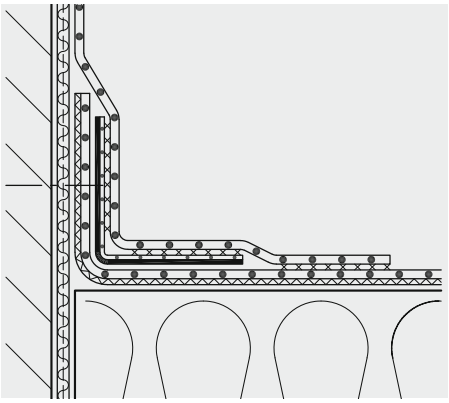
15 Forming of EVALASTIC® coated metal sheets

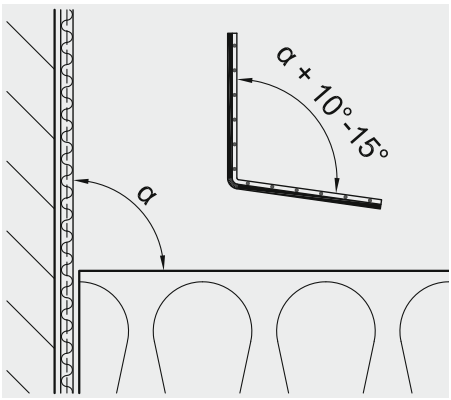
15.2 Bending

EVALASTIC® coated metal sheets can be bent on any standard bending machine. The bending radius should be 1.2 mm - 1.8 mm.

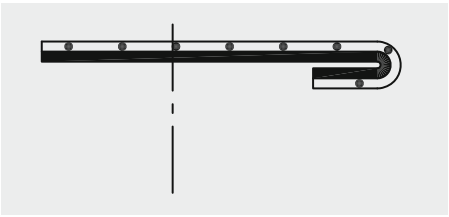
Attention! Ensure that the EVALASTIC® coating is in the correct position.

Coated metal angles for valleys are to be bent with an angle which is approx. 10° - 15° wider than the required angle. This will guarantee that the coated metal angles will fit closely to the substrate when fastened.





With **coated metal** strips the same effect will be reached by reverse bending.



Notes

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